Nephrology

1. A 48 year old diabetic and hypertensive patient is referred to you due to presence of macro albuminuria on routine follow up testing. His GFR is also decreased and is 50ml/min/1.73m2. His BP is 125/75, and HBA1C is 8.1%. He is taking lisinopril 10 mg, gliclazide 30 mg and aspirin 75. Which of the following is the most appropriate next step?
   - A. Increase lisinopril to 20 mg
   - B. Add losartan ✓
   - C. Increase dose of gliclazide
   - D. Add diltiazem ✓ 6
   - E. Strat insulin

50

30

50

10

Ans: Increase dose of gliclazide

Explanation: Presence of macro albuminuria in DM suggests diabetic nephropathy. The two most important steps in management are start ACEi or ARB to keep blood pressure below 130/80 and good glycemic control. As this patient is already taking lisinopril and blood pressure is below the target, the best management here is increase the dose of gliclazide to decrease the HBA1C to below 7. Insulin is not required at this stage and indicated when GFR is less than 30. The combination of ARB and ACEi is not recommended in diabetic nephropathy. HBA1C should be measured 4 times per year in diabetic nephropathy when glycemic target is not met or after change in regimen.

2. A patient with stage 4 chronic kidney disease presented with dysuria and mild fever for 2 days. Urinalysis revealed positive nitrites and positive leukocyte esterase. What should be your next step?
   - A. Ceftriaxone IV
   - B. Oral ciprofloxacin ✓
   - C. Oral Nitrofurantoin
   - D. IV vancomycin
   - E. IV Amikacin

UTI

E coli

[illegible] of Amoxicillin

Ans: Oral ciprofloxacin

Explanation: This patient with chronic renal disease has urinary tract infection as reflected by dysuria, positive leucocyte esterase and nitrite. The first line treatment for UTI is ciprofloxacin. Amikacin, vancomycin and nitrofurantoin are contraindicated in CKD stage 4. Ceftriaxone IV can be given in complicated UTI.

3. A patient of CKD stage 4 due to diabetic nephropathy has low hemoglobin is started on erythropoietin and IV iron. Which of the following is the target hemoglobin level for this patient?
    - A. 7-8 g/dl
    - B. 9-10 g/dl
    - C. 11-12 g/dl
    - D. 13-14 g/dl
    - E. 14-15 g/dl

1.0g/L

Ans: 11-12 g/dl

Explanation: Guidelines recommend a target hemoglobin of 11-12 in patients with CKD. Higher levels of hemoglobin are associated with high risk of cerebrovascular disease and increased mortality.

4. A 59 year old diabetic female presented with history of anorexia, itching and metallic taste in her mouth for 2 months. Labs were done which showed serum creatinine of 3.7. The estimated GFR is 16ml/min/1.73m2. Which of the following abnormality on testing would be present additionally?
    - A. Potassium 2.9
    - B. HCO3 15
    - C. Calcium 10.3
    - D. PO4 1.2
    - E. [✓ HCO3 35]

hyperkalemia
metabolic
alkal

Ans: HCO3 15

Explanation: This diabetic patient has developed CKD stage 4 disease and is having uremic symptoms. CKD is associated with electrolytes and acid base imbalance. Common abnormalities of electrolyte disturbance include hyperkalemia, hypocalcemia and hyperphosphatemia with metabolic acidosis.

5. A patient with history of diabetic nephropathy came for follow up. Labs were done which showed Hb 11.6, creatinine 3.2, urea 95, K 4.2, Ca 8.1, P 5.6 and HCO3 14. Which of the following test should be done next to screen for renal osteodystrophy in this patient?
    - A. ESR

B. CRP
C. Intact PTH
D. Bone biopsy
E. Alkaline phosphatase

Screening
main

Ans: Intact PTH

Explanation: This patient with diabetic nephropathy and CKD has low calcium and high phosphate levels. Guidelines recommend measurements of intact PTH hormone to screen for the diagnosis of renal osteodystrophy which will show high level of PTH due to secondary hyperparathyroidism.

6. A 67 year old male with ESRD on peritoneal dialysis presented with abdominal pain for 2 days. On analysis, a sample of fluid from the dialysis catheter is cloudy. Which of the following is the most appropriate next step?
   A. Intraperitoneal antibiotics ✓
   B. IV antibiotics
   C. Change dialysis catheter
   D. Shift to hemodialysis
   E. Reassure that it's normal

↓↓ MRSA

MRSA

Mero

+ lipids

Ans: Intraperitoneal antibiotics

Explanation: Peritoneal dialysis-related peritonitis remains the major complication of this modality of dialysis. Most cases of PD-related peritonitis are the result of **"touch contamination"**, where the patient or their helper inadvertently breaks sterile technique and contaminates the catheter or its connections. The most common pathogens are coagulase-negative staphylococcal species (e.g., Staphylococcus epidermidis) that commonly colonize human skin and hands, and Staphylococcus aureus, which together are responsible for 50% or more of infections in most series. New onset of abdominal pain, fever, or the appearance of cloudy effluent should prompt immediate evaluation for peritonitis. Samples of dialysis effluent should be obtained for WBC count, differential, Gram stain, and culture before the administration of antibiotics. The presence of >100 WBCs/μL with >50% neutrophils usually indicates peritonitis. Antibiotics should be administered intraperitoneally and should be started after taking sample for diagnosis. The advantages of intraperitoneally administered antibiotics include delivery of a high concentration of antibiotics at the site of infection, antibiotics also being absorbed into the systemic circulation and diffusing back into the peritoneum, allowing daily or less frequent administration, and intravenous (IV) access, which would be required for 2–4 weeks, is not necessary. The development of peritonitis is not an indication for change to hemodialysis and catheter removal is indicated if infection is not controlled with initial treatment or there is tunnel site infection.

7. A 60 year old male with ESRD on hemodialysis reports that he has cramps in body with feeling weakness after each session. Examination showed BP 90/60, pulse 85/min with clear chest on auscultation and no pedal edema. Which of the following is the most appropriate next step?
   - A. Decrease dialysate temperature
   - B. Decrease dialysis time
   - C. Increase dialysate calcium
   - D. Increase the dry weight
   - E. Add sodium modeling

Ans: Increase the dry weight

Explanation: Development to cramps during and after dialysis with weakness and low blood pressure after dialysis are characteristics of excessive volume removal during dialysis, so increasing the dry weight will prevent excess volume removal and will alleviate the associated symptoms. Sodium remodeling is done when an increased amount of volume removal is required. Decrease temperature improves the ability to ultrafiltrate fluid in patients with low BP, but this patient does not require ultrafiltration due to clear lungs and absence of pedal edema. Decreasing the dialysis time is also not required and will not alleviate his symptoms because same amount of fluid will be removed in shorter time.

8. A diabetic patient on treatment with metformin and sitagliptin came for follow up testing which showed urinary albumin of 150. His blood pressure is 140/90. What should be the next step in treatment?
   - A. Add prazosin
   - B. Add Ramipril
   - C. Add carvedilol
   - D. Add diltiazem
   - E. Add hydralazine

30-300

Ans: Presence of microalbuminuria in diabetic patient=> start ACEi or ARB irrespective of the blood pressure level.

9. A 43 year old male presented with history of hemoptysis and hematuria for 2 weeks. Patient has history of recurrent sinusitis and epistaxis. Labs showed Hb 10.1, WBC 18000, platelets 420,000, creatinine 3.1. Urinalysis results 2+ protein and 3+ blood. Which of the following is the most probable diagnosis?

   A. Interstitial nephritis

   B. Good pasture syndrome

   C. IgA nephropathy

   D. Post streptococcal GN

   E. Granulomatosis with polyangitis ✓

Ans: Granulomatosis with polyangitis

Explanation: Hemoptysis with hematuria and acute nephritic syndrome with previous history of upper respiratory tract involvement is typical of granulomatosis with polyangitis previously known as Wagner's granulomatosis. Interstitial nephritis is associated with urinary eosinophilia and it is not associated with hemoptysis. Upper respiratory tract involvement is not seen in Good Pasture syndrome.

10. A 45 year old female with history of progressive renal failure due to chronic glomerulonephritis complains of numbness and burning sensations in her legs. Examination showed loss of pinprick and vibration sense below knee and absent ankle jerk. Her latest serum creatinine is 5.7. What is the most appropriate next step in management?

    A. Start duloxetine

    B. Start pyridoxine

    C. Start cobalamin

    D. Renal replacement therapy ✓

    E. Start pregabalin

30ml/min

uremia

urgently

Ans: Start renal replacement therapy

Explanation: The development of advancing peripheral neuropathy is in indication for dialysis. Delaying dialysis could allow the development of irreversible motor deficits, such as foot drop. Prompt institution of dialysis, by contrast, usually prevents the progression of uremic peripheral neuropathy and may relieve early sensory defects. No pharmacologic agents would be of significant benefit in the clinical situation of peripheral neuropathy in chronic kidney disease. The typical uremic peripheral neuropathy usually involves large diameter axons and is an axonal neuropathy with reduced sensory amplitudes initially and reduced motor amplitudes in later stages while conduction velocities are minimally affected.

11. In patients with CKD, which of the following does not contribute to the development of bone disease?
    - A. Impaired renal production of 1,25 OH D3
    - B. Hyperphosphatemia
    - C. Aluminum containing antacids
    - D. Loss of calcium by dialysis
    - E. Metabolic acidosis

Ans: Loss of calcium by dialysis

Explanation: Impaired renal production of 1, 25 dihydroxy vitamin D3 leads to decreased calcium absorption from the gut. Impaired renal phosphate excretion leads to hyperphosphatemia, which initiates hyperparathyroidism. Hyperparathyroidism is worsened by hypocalcemia, which is present because of hyperphosphatemia and decreased enzymatic conversion of 25 (OH) D to 1, 25(OH) leading to decreased gut absorption of calcium. Finely, 1, 25 OH D deficiency worsens hyperparathyroidism, as it is a direct inhibitor of PTH secretion into bone. The resultant decreased serum calcium concentration leads to secondary hyperparathyroidism. Chronic metabolic acidosis leads to dissolution of bone buffers and cause decalcification. Aluminum administered in long-term therapy, although useful in controlling hyperphosphatemia and thereby hypocalcemia, can be taken up by bone and contribute to altered bone matrix. There is no significant loss of vitamin D or calcium associated with currently employed dialysis techniques.

12. A 27 year old male presented with right sided flank pain radiating from loin to groin region with nausea. Which of the following is the investigation of choice for this patient?
    - A. X-ray KUB
    - B. Ultrasound KUB
    - C. Helical CT KUB ✓
    - D. Urinalysis
    - E. MRI KUB

Ans: Helical CT KUB

Explanation: The imaging modality of choice for detecting stones within kidney, ureter and bladder is helical CT KUB without contrast. Ultrasound and X-ray KUB can be used as initial tests, but they can miss some stones.

13. A 45 year old male referred to you for an abnormal urinalysis result which showed persistent microscopic hematuria. Microscopic examination of urine showed 50-70 RBCs in three reports 6 months apart. What should be the next best management step?

    A. CT KUB

    B. IV urogram

    [✓ C. Cystoscopy]

    D. Renal biopsy

    E. Repeat urinalysis

E→B

Ans: Cystoscopy

Explanation: Persistent microscopic hematuria=> do cystoscopy plus renal ultrasound to rule out bladder malignancy and stones. If cystoscopy is normal, CT KUB is best next investigation.

14. A diabetic patient came for review of labs which were done 1 week back as follow up tests. Labs showed microalbuminuria. What is the range of albumin in urine to define this condition?

    A. 0-30 mg/ day

    B. 30-200 mg/day

    [✓ C. 30-300 mg/ day]

    D. 50-300 mg / day

    E. > 300 mg/ day

Ans: 30 – 300 mg /day

Explanation: Microalbuminuria is defined as urinary excretion of albumin 30-300mg/day or 20-200microgram / min or albumin creatinine ratio 3.5- 15. Persistent microalbuminuria has been associated with an increased risk of atherosclerosis and cardiovascular mortality.

15. A 31 year old woman with a diagnosis of diffuse systemic scleroderma presented with headache, blurred vision and nausea for 12 hours. Examination showed BP 180/100 with skin changes of scleroderma. Labs showed creatinine 3.1, Hb 11.2 with schistocytes on peripheral film. Which of the following is the most appropriate treatment for her?

A. Plasma exchange
B. Cyclophosphamide
C. [✓ Captopril]
D. Methylprednisolone
E. Urgent dialysis

Ans: Captopril

Explanation: This patient is having scleroderma renal crisis in the setting of diffuse systemic scleroderma. The most appropriate treatment for this condition is Captopril. Scleroderma renal crisis occurs in 10 to 15% of patients with systemic sclerosis and is more frequent in diffuse type as compared to limited systemic sclerosis. Vascular involvement of afferent arteriole leads to glomerular ischemia and hyperreninemia. The typical presentation is acute onset of oliguric kidney disease and severe hypertension with mild proteinuria, microangiopathic hemolytic anaemia and thrombocytopenia. Treatment with an ACEi is essential to restore kidney function and manage hypertension associated with this. Captopril is the preferred agent because it has been most extensively studied and its short half-life allows rapid titration.

16. A 45 year old male presented with lower abdominal pain, pain in both knee joints and ankle joints with an itchy skin rash on both buttocks and legs for 3 days. Labs were done which showed normal CBC, ESR 88, creatinine 1.7, 3+ protein and 4+ blood in urine. Stool for occult blood is also positive. Which of the following is the most appropriate therapy for him?

A. Cyclophosphamide
B. Dapsone
C. [✓ Prednisone]
D. Colchicine
E. Ibuprofen

HSP.

Ans: Prednisone

Explanation: The clinical findings and laboratory tests demonstrate the presence of a small vessel vasculitis affecting the skin joints kidneys in gastrointestinal tract. The most probable diagnosis is adult onset Henoch- Schonlein purpura (HSP). In children, it is generally a benign, self limited condition and treatment is most commonly supportive pending spontaneous remission. In adults, it is less common and typically is more severe. Adults with HSP are more likely to experience severe disease develop irreversible organ damage before the acute disease resolves. In this case, the involvement of multi organ systems including the gastrointestinal tract and kidney, warrants prednisone therapy. Cyclophosphamide is used with steroids in HSP nephritis when steroids alone are not controlling the disease. Dapsone and colchicine are used for skin manifestation of leukocytoclastic vasculitis, but has less role in organ damage. Treatment with steroids is recommended initially who have severe HSP with involvement of multiple organ systems.

17. A 65 year diabetic male presented with NSTEMI for which a decision is made to do angiography. What is the best method to prevent contrast induced kidney injury in this patient?

A. N acetyl cysteine
B. NAHCO3 infusion
C. [✓ 0.9% saline]
D. Simvastatin
E. Mannitol

Ans: 0.9% Saline

Explanation: Contrast induced nephropathy is defined as a 25% increase in creatinine within 3 days of the IV administration of contrast media. The best treatment for CIN is to prevent it. Guidelines recommend 0.9% saline infusion @1ml/kg/hr for 12 hours before and 12 hours after procedure. NAC, NAHCO3 and statins role in prevention of CIN is equivocal.

18. An IV drug user of heroin is referred due to an abnormal urinalysis result which showed 3+ proteinuria. He is otherwise normal and denies any symptoms. Other tests showed creatinine 3.6 and 24 hour urinary protein 4.5g. Hepatitis serology and HIV serology is negative. What is the most probable cause of renal impairment? FSGN

A. Membranous nephropathy
B. Membranoproliferative glomerulonephritis
C. [✓ Focal segmental glomerulosclerosis]
D. Minimal change disease
E. Septic embolization

Ans: Focal segmental glomerulosclerosis

Explanation: Focal segmental glomerulosclerosis is associated with heroin use with or without HIV infection. Septic embolization cannot be the cause of renal impairment in asymptomatic patients.

19. A 35 year old female presented with cough and sputum with high grade fever for 3 days. Labs were done which showed Hb 12, WBC 20,000 with high CRP. Creatinine is 3.1 with urea 159 mg. Urine osmolality is 775 with urinary sodium of 4 mmol. FeNa is 0.4%. What is the cause of renal impairment?

    [✓ A. Pre renal acute renal failure]

    B. Acute tubular necrosis

    C. Acute interstitial nephritis

    <20

    D. Post streptococcal GN

    E. Rapidly progressive GN

Ans: Pre renal acute renal failure

Explanation: High urea relative to creatinine, high urine osmolality with low urinary sodium and FeNa < 1% in a patient with pneumonia suggest pre renal acute renal failure as the diagnosis. The next best treatment step is antibiotics therapy with IV hydration with monitoring of kidney function.

20. A 12 year old male is presented with periorbital swelling and pedal edema. Urinalysis showed 4+ proteinuria. Which of the following is the most common cause of his presentation?

    A. Membranous nephropathy

    [✓ B. Minimal change disease]

    C. Membranoprolifrative glomerulonephritis

    D. Focal segmental glomerulosclerosis

    E. IgA nephropathy

Ans: Minimal change disease is the most common cause of nephrotic syndrome in children.

21. A known case of hepatitis C patient presented with history of uncontrolled blood pressure despite taking amlodipine and valsartan. He has developed pedal edema for 5 days. Labs were done which showed urea 67, creatinine 2.56. Urinalysis showed blood ++, protein +++, LE negative. What is the most probable diagnosis?

    DPGN.

    A. Diffuse proliferative GN

    B. Focal segmental glomerulosclerosis

    [✓ C. Membranoprolifrative GN]

    D. Membranous nephropathy

    E. IgA nephropathy

Ans: Membranoprolifrative GN

Explanation: High blood pressure with renal impairment and glomerulonephritis in a patient with history of hepatitis C mostly probably suggests membranoprolifrative glomerulonephritis as the cause. **GN in Hepatitis=> always rule out MPGN.**

MPG IgA

22. A 22 year old male presented with history of blood in the urine for 2 days. He is taking supportive treatment for an upper respiratory tract viral infection. Examination is normal. Labs were done which showed normal urea and creatinine with urinalysis showing blood 4+ and protein trace. What is the most likely diagnosis?

A. Diffuse proliferative GN

B. Minimal change disease

C. [✓ IgA nephropathy]

D. Acute interstitial nephritis

E. Drug reaction

21

4

SIADH

3%

0.9

Ans: IgA nephropathy

Explanation: Synpharngitis glomerulonephritis=> IgA nephropathy

Glomerulonephritis after 10-14 days => post streptococcal (diffuse proliferative GN)

Nephrotic range proteinuria after URTI => minimal change disease.

23. A 51 year old female with history of diabetic nephropathy came for follow up tests which showed Hb 11.4, creatinine 3.5, urea 85, calcium 7.9 and PO4 6.3. In addition to low phosphate diet what would be the next best step?

7 2.5

A. [✓ Sevelamer]

B. Cinacalcet

C. [✓ Calcium acetate]

Siva

D. Calcitriol

E. Lanthanum carbonate

Ans: Calcium acetate

Explanation: This diabetic patient with CKD has hyperphosphatemia with low calcium level. Hyperphosphatemia is the main culprit for development of renal osteodystrophy so, the 1st step in management is dietary restriction of high phosphate containing diet with phosphate binders. There are 2 types of phosphate binders. Calcium containing like calcium acetate and calcium carbonate which should be used 1st line in patients with high PO4 and low calcium. Non calcium containing like sevelamer and lanthanum carbonate, which should be used when calcium is high with high phosphate. Calcitriol is used when phosphate is normal after phosphate binder's therapy. Cinacalcet is used when PTH is not controlled with initial therapy.

24. Which of the following type of glomerulonephritis is associated with highest risk of developing renal vein thrombosis?
    - A. Minimal change disease
    - B. Membranous nephropathy ✓
    - C. Focal segmental glomerulosclerosis
    - D. Membranoprolifrative GN
    - E. Diffuse proliferative GN

Ans: Membranous nephropathy

Explanation: Membranous nephropathy is most commonly associated with the development of venous thrombosis especially renal vein thrombosis. This occurs due to non-selective proteinuria in membranous nephropathy which causes loss of anticoagulant proteins in the urine as well as the overproduction of procoagulant factors from the liver. Risk of thrombosis is correlated with the level of albumin. Lower the albumin level, higher is the risk.

25. A 13 year old girl presented with pedal edema and periorbital swelling for 3 weeks. Labs were done which showed creatinine 0.8, albumin 1.9, 4+ proteinuria with no blood. What should be the next most appropriate step in management?
    - A. 20% albumin
    - B. Prednisone ✓
    - C. Renal biopsy
    - D. Cyclophosphamide
    - E. Rituximab

ANS: Prednisone

Explanation: The most common cause of nephrotic syndrome in children is minimal change disease and biopsy is not required at the initial management. Guidelines recommend to start steroids therapy in children presenting the nephrotic range proteinuria. A renal biopsy is usually not performed if presentation is typical and the patient responds to therapy with oral prednisone at conventional doses. Therefore, in this setting steroid-sensitive NS can be considered synonymous with MCD. Cyclophosphamide is used in steroids refractory or dependent patients.

26. A 70 year old smoker presented with bilateral lower limb swelling. Labs were done which showed creatinine 3.1, urea 75, albumin 2.3, urinalysis showed protein 4+ and blood +1. CXR showed a mass in right upper lobe. What is the most probable diagnosis?

   A. Membranous nephropathy
   B. Minimal change disease
   C. Membranoprolifrative GN
   D. Focal segmental glomerulosclerosis
   E. Diffuse proliferative GN

Ans: Membranous nephropathy

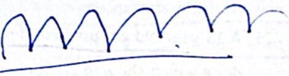
Explanation: History of smoking and mass on CXR suggest lung cancer. Nephrotic syndrome associated with malignancy occurs most probably due to membranous nephropathy.

27. A kidney biopsy was done for a 26 year old female who presented with nephrotic syndrome showed thickened basement membrane with sub epithelial spikes and granular deposit of IgG and C3 complement. What is the most probable diagnosis? $\boxed{C3}$

NSAIDS

Mem

   A. Minimal change disease
   B. Membranous nephropathy
   C. Focal segmental glomerulosclerosis
   D. Diffuse proliferative GN
   E. Membranoprolifrative GN



Ans: Membranous nephropathy

Explanation: Membranous nephropathy is an immunologically mediated disease in which immune complexes deposit in the subepithelial space. On Light microscopy, the mesangium is normal, with no hypercellularity. All glomeruli are involved. The capillary walls are thickened with patent capillary lumina. Subepithelial deposits are seen. Immunofluorescence microscopy shows granular capillary wall staining for immunoglobulin G (IgG), with C3 and both kappa and lambda light chains. On electron microscope, dense deposits are seen with spikes along the capillary wall.

28. Which of the following is the gold standard test for the diagnosis of renal osteodystrophy?

    A. Intact PTH
    B. Alkaline phosphatase
    C. Bone biopsy ✓
    D. DEXA scan
    E. PO4+ Calcium level

Ans: Bone biopsy

Explanation: Bone biopsy is the gold standard investigation for the assessment of renal osteodystrophy and should be considered in patients in whom the etiology of clinical symptoms and biochemical abnormalities is in question, and the results may lead to changes in therapy. All the other tests have poor sensitivity and specificity for diagnosing renal osteodystrophy.

29. Which of the following is the target blood pressure for a patient with CKD and urine albumin < 30mg/24 hours?

    A. <130/80 mmhg
    B. <135/85 mmhg
    C. <140/90 mmhg
    D. <130/90 mmhg
    E. <140/80 mmhg

[illegible]

140/90.

130/80

1

Ans: < 140/90 mmhg

Explanation: CKD with albuminuria < 30mg /24 hours => keep blood pressure <140/90 mmhg, both in diabetics and non diabetics.

CKD with albuminuria > 30 mg/ 24 hours => keep blood pressure < 130/80 mmhg in both diabetic and non diabetics.

30. A 52 year old male is presented with swelling and thickening of the skin of the upper and lower extremities. Patient is a known case of diabetic nephropathy and she has had MRI with gadolinium as part of the work up for adrenal gland malignancy. Examination of skin showed cobblestone appearance of the skin with hyperpigmented and indurated plaques on both legs and arms. What is the most probable diagnosis?

    A. Amyloidosis

B. Scleroderma
C. Eosinophilic fasciitis
D. Nephrogenic systemic fibrosis
E. Calciphylaxis

Ans: Nephrogenic systemic fibrosis G

Explanation: Nephrogenic systemic fibrosis is a rare fibrosing disorder characterized by skin thickening of the extremities and trunk and dermal fibrosis. This disease only occurs in patients with kidney failure and is most commonly linked to gadolinium exposure, as in gadolinium based contrast agents, because these agents are excreted exclusively by the kidneys. It can also involves internal organs like lungs, heart and esophagus. It can also leads to contractures due to poor mobility of joints. Scleroderma, eosinophilic fasciitis and myxodema are DDs of NSF, but history of gadolinium exposure in CKD is typically associated with NSF.

>2.5

31. A patient with stage 4 kidney disease has following blood test results, Hb 11.3, Ca 10.6, PO4 4.6, PTH 12 (N more than 15), alkaline phosphatase 125. Patient is taking calcium acetate and calcitriol. Patient is at risk of developing?

A. Osteosarcoma
B. Osteoporosis
C. Adynamic bone disease
D. Tertiary hyperparathyroidism
E. Osteomalacia

Ans: Adynamic bone disease

Explanation: High calcium, high phosphate and low PTH and low alkaline phosphatase in CKD patient who are on treatment for bone disease show reduced bone turnover due to over treatment, this is called adynamic bone disease. Adynamic bone disease is characterized by a low-bone turnover without osteoid accumulation, i.e. with a thin osteoid seam. Both the rate of collagen synthesis by osteoblasts and the subsequent mineralization of bone collagen are subnormal. The latter distinguishes ABD from the second low-turnover form, i.e. osteomalacia, where a mineralization defect exceeds the defects in bone formation, resulting in a relative osteoid excess. Bone alkaline phosphatase is probably the single most useful biochemical parameter for the assessment of bone formation. Elevated levels of bone alkaline phosphatase virtually exclude an adynamic renal bone disease. In osteomalacia, alkaline phosphatase is high. A relative 'hypoparathyroidism' is regarded as an important risk factor for ABD. The treatment currently follows two principles: first, to reduce calcium and vitamin D load and second, to restore PTH activity.

32. A 25 year old male presented with complaints of generalized muscular pains associated with dark urine for 2 days. Patient has started gym 5 days back and started on vigorous exercise for 2 days. Examination showed tenderness and swelling of muscles of upper and lower limbs. Labs showed creatinine 7.1, urea 82, Potassium 5.5, HCO3 14. Urinalysis showed blood ++++ and microscopic examination showed RBCs 2-3. What should be the next most important management step in this patient?

A. [✓ IV Saline]
B. IV Mannitol
C. IV furosemide
D. IV NAHCO3
E. Urgent dialysis

Ans: IV Saline

Explanation: Acute kidney injury after vigorous exercise with disproportionately high creatinine to urea, positive blood on urinalysis and absent RBCs suggest rhabdomyolysis as the most probable cause of acute kidney injury in this patient. The best next management should be to check CPK level and urinary myoglobin and aggressive IV crystalloid infusion with a goal of maintaining a minimum urine output of 2ml/kg/hour. Forced diuresis, urinary alkalinization and mannitol therapy has not shown benefit in controlled studies and currently not recommended in management. The outcome of rhabdomyolysis is usually good and majority of patients recover renal functions with supportive therapy and dialysis in not needed urgently.

Disproportionate high creatinine to urea => think about rhabdomyolysis

Urinalysis showed blood but microscopy shows no RBCs => think of rhabdomyolysis leading to myoglobinuria

Disproportionate high urea to creatinine=> think about dehydration

33. A 36 year old male presented with frothy urine associated with pedal edema for 3 weeks. Labs were done which showed creatinine 4.3, urea 156, K 4.3, HCO3 15. Urinalysis showed protein +++ and blood ++++. What is the best management step in this patient?

    A. Hemodialysis
    B. Check anti DsDNA
    C. Anti GBM antibodies
    D. Check C-ANCA
    E. [✓ Renal biopsy]

Ans: Renal biopsy

Explanation: This patient has most probably rapidly progressive GN which can be caused by many conditions. All of the above steps can be used for diagnosis and management, but the best management step would be to obtain a kidney biopsy which will confirm the cause of GN. Any patient who presents with proteinuria and hematuria should have a kidney biopsy.

34. A 45 year old male presented with pedal edema and periorbital swelling. Examination showed blood pressure of 150/100. Labs were done which showed creatinine 1.6, urea 59 and urinalysis result showed proteins ++++, blood ++. Renal biopsy was done which showed mesangial and subendothelial deposits with double contour. Immunofluorescence showed irregular capillary wall deposit which stains for IgM and C3. What is the most likely diagnosis?

    A. Fibrillary GN
    B. C3 GN
    C. Membranoprolifrative GN
    D. Membranous nephropathy
    E. Amyloidosis

130 140

Ans: Membranoprolifrative GN

Explanation: The presence of both proteinuria and hematuria with high blood pressure is present in MPGN, C3 GN and membranous nephropathy. Biopsy is the diagnostic of MPGN in this patient which showed mesangial and subendothelial deposits with double contour due to new GBM formation beneath subendothelial deposits called ***tram track line*** which is typical appearance of MPGN. Immunofluorescence also showed deposits of IgM and C3 which are also typical of MPGN. In fibrillary GN, randomly arranged fibrils which stains for polyclonal IgG are seen. In amyloidosis, more acellular fibrils which are Congo red positive are seen. In C3 GN, only C3 deposits are seen. In membranous nephropathy, IgG deposits are seen.

35. A 45 year old male presented with arthralgia and skin rash on lower limbs associated with pedal edema. Labs were done which showed Hb 10.3, platelets 210,000, creatinine 2.1, anti HCV positive, RA factor positive and low level of C3 and C4. What investigation should be done next?
    - A. Anti GBM antibodies
    - B. C-ANCA
    - C. Anti CCP antibodies
    - D. Cryoglobulins
    - E. Anti nuclear antibodies

Ans: Cryoglobulins

Explanation: Glomerulonephritis with anti HCV positive with RA factor positive and low complement levels, always rule out cryoglobulinemic associated MPGN, serum cryoglobulins should be measured. Mixed cryglobulinemia, type II and type III, refers to the presence of circulating cryoprecipitable immune complexes in the serum and manifests clinically by a classical triad of purpura, weakness and arthralgias. MC is characterized by variable organ involvement including skin lesions, chronic hepatitis, membranoprolifrative glomerulonephritis, peripheral neuropathy, diffuse vasculitis, and, less frequently, interstitial lung involvement and endocrine disorders. Circulating mixed cryoglobulins, low C4 levels and orthostatic skin purpura are the hallmarks of the disease. The first-line treatment of MC should focus on eradication of HCV.

36. Which of the following type of glomerulonephritis is associated with normal level of serum compliment protein?
    - A. Cryoglobulinemic GN
    - B. Cholesterol embolism
    - C. Post streptococcal GN
    - D. Membranous nephropathy
    - E. Lupus nephritis

Ans: Membranous nephropathy

Explanation: Following GN are associated with low complement levels

- MPGN and cryoglobulinemic GN: C4 level drops more than C3
- Lupus nephritis: C3 and C4 both decrease equally
- Post streptococcal GN: C3 level drops more than C4
- Cholesterol embolism: Cholesterol-embolization syndrome (CES) is a systemic disease caused by showering of atherosclerotic plaque materials, such as cholesterol crystals (CCs), from the aorta and its major branches to distal circulation, leading to ischemic and inflammatory damage to multiple organs. Complement levels are frequently decreased in cholesterol embolism.

Membranous nephropathy is not associated with low complement level.

37. A 45 year old patient has multiple episodes of hemoptysis associated with SOB for 3 days. Labs were done which showed Hb 9.2, WBC 18,000, platelets 170,000, urea 176, creatinine 7.5, K 5.5 with ++++ blood and 1+ protein on urinalysis. Anti GBM antibodies is positive. What should be the next best management step?

   A. Methylprednisolone
   B. Rituximab
   C. Cyclophosphamide ✓
   D. Plasmapheresis
   E. Plasmapheresis+ Methylprednisolone

MRSA.
ph
ML cyclo

Ans: Plasmapheresis + Methylprednisolone

Explanation: Hemoptysis with hematuria and rapidly progressive GN with positive anti GBM antibodies suggest Good pasture syndrome as the diagnosis. As this patient is having SOB and HB is low which suggests alveolar hemorrhage, so the best treatment for this patient would be daily plasmapheresis with pulsed methylprednisolone. Cyclophosphamide should also be added in the regimen. The goal of therapy is rapidly remove circulating antibody, primarily by plasmapheresis and to stop further production of antibodies using immunosuppression with medications.

38. A patient of CKD stage 3b is started on calcium acetate therapy for renal osteodystrophy. Which of the following will guide you to control the Ca, PO4 product?

   A. 25(OH) D
   B. Alkaline phosphatase
   C. Intact PTH
   D. Albumin

E. FGF23

Ans: Intact PTH

Explanation: High calcium phosphate product in CKD is associated with high risk of developing cardiovascular disease and it is recommended to keep this product to less than 55. The best test to guide the control of this product is done by the assessment of intact PTH level. This should be kept above the upper limit of normal to avoid high Ca- PO4 product and to reduce the risk of development of adynamic bone disease.

39. A 53 year old male known case of CKD on HD presented with multiple necrotic ulcers on lower limbs for 1 month. Labs showed high Ca and high PO4. How will you confirm your diagnosis?
    A. Culture from ulcer
    B. Blood culture
    C. Skin biopsy ✓
    D. Intact PTH
    E. Doppler USG

Ans: Skin biopsy

Explanation: History of CKD with high calcium and phosphate with ulceration on lower limbs suggest the diagnosis of calciphylaxis. Abnormalities present in the uremic patient as hyperphosphatemia, hyperparathyroidism, elevated plasma calcium and phosphate product, active vitamin D supplementation and deficiency of vascular calcification inhibitors cause this condition. The cutaneous lesions are described as the sudden development of tender, violaceous skin lesion of livedoid or reticular pattern that progress to necrotic ulcerations, which frequently become superinfected. These ulcers heal poorly and are very painful. Areas commonly affected are the lower limbs and those with thick adipose tissue, such as the breasts, abdomen and gluteal region. Besides the skin other organs and systems can be involved as lung, heart, kidneys, skeletal muscle, tongue, pancreas and gastrointestinal tract. The diagnosis can be based on clinical grounds, supported by histological analysis of skin biopsy.

40. A patient of CKD has routine follow up blood tests which showed urea 129, creatinine 6.3, Ca 10.3, PO4 6.3, intact PTH 600(N 15-65) and alkaline phosphatase 217. What is the most likely diagnosis?
    A. Adynamic bone disease
    B. Osteomalacia
    C. Autonomous PTH secretion

D. Secondary hyperparathyroidism

E. Primary hyperparathyroidism

Ans: Autonomous PTH secretion

Explanation: Adynamic bone disease is associated with high Ca, high phosphate, low PTH and low alkaline phosphatase. Osteomalacia is associated with low calcium, low phosphate, high PTH and high alkaline phosphatase. Secondary hyperparathyroidism is associated with low calcium, high phosphate, high PTH and high alkaline phosphatase. Primary hyperparathyroidism is associated with high calcium, low phosphate, high or high normal PTH and high alkaline phosphatase. **Autonomous secretion of PTH is associated with high Calcium, high phosphate, high PTH and high alkaline phosphatase.** Tertiary hyperparathyroidism is observed most commonly in patients with chronic secondary hyperparathyroidism. The hypertrophied parathyroid glands enlarge over time and continue to oversecrete parathyroid hormone, despite serum calcium levels that are within the reference range or even elevated. In these cases, the hypertrophied glands become autonomic and cause hypercalcemia, even after withdrawal of calcium and active vitamin D therapy. They also may become resistant to calcimimetic treatment. This type of tertiary disease is particularly dangerous because the phosphate level is also elevated. If the calcium value multiplied by the phosphate value yields a high product, diffuse calcinosis may occur. Treatment is subtotal or total parathyroidectomy with autotransplantation to obtain long-term cure.

PTH PTH PTH↑↓ PTH↑↑↑

41. A known case of CKD patient presented with chest pain for 2 hours. Chest pain is left sided and worsened with taking deep breath. Examination showed a scratching sound on auscultation which is present even after holding breath. What should be the next best management step?

    A. Ibuprofen

    B. Colchicine

    C. Dialysis with Heparin

    D. Dialysis without heparin ✓

    E. Prednisone

6.0
= 8.0
= 9.0

Ans: Dialysis without heparin

Explanation: Chest pain accentuated by breathing with friction rub in CKD indicates uremic pericarditis which is an absolute indication for urgent dialysis. Heparin should be avoided in these patients because it can leads to hemorrhage in the pericardial space.

42. The typical anemia of chronic kidney disease is:
   - A. Microcytic hypochromic
   - B. Microcytic normochromic
   - C. Normocytic normochromic
   - D. Normocytic hypochromic
   - E. Normocytic hyperchromic

Ans: Normocytic normochromic

Explanation: A typical normocytic normochromic anemia is observed as early as stage 3a CKD and is universal in stage 4.

43. A patient of ESRD on dialysis has his routine session done 2 hours ago. He has developed severe tooth ache and his dentist wants dental extraction. Dental surgeon needs your opinion regarding bleeding prevention in this patient. What will you recommend?
   - A. Whole blood transfusion
   - B. FFP transfusion
   - C. Desmopression
   - D. Protamine sulphate
   - E. Cryoprecipitate

Ans: Desmopression

Explanation: Uremia is commonly associated with platelets dysfunction due to abnormal platelets aggregation and adhesiveness. Clinical manifestations include an increased tendency to bleeding and bruising and prolonged bleeding from surgical procedures. Platelets count is normal with high bleeding time. VWF level and FVIII levels are high in patients with CKD. For short procedures, Desmopression can be used to prevent bleeding for 3-4 hours. Desmopression therapy normalizes the bleeding time. _A significant increase in platelets serotonin uptake and ATP release is detected after DDAVP therapy._ Other therapies include IV conjugated estrogen and dialysis. Estrogen is rarely used for this purpose.

44. You have ordered urine microscopic examination in a patient who is suspected to have glomerulonephritis to see the casts, what type of casts you will specifically looks for?
   - A. Hyaline casts
   - B. Fatty casts
   - C. RBC casts

D. Waxy casts

E. WBC casts

Ans: RBC casts

Explanation: Casts are tiny tube shaped particles that are formed as the result of solidification of proteins in the lumen of the nephron. They are formed by the precipitation of Tamm Horsfall mucoprotein which is secreted by renal tubular cells. Mostly they are formed in the DCT or the collecting ducts. There are different types of casts:

- **Fatty casts**: Are present in nephrotic syndrome
- **Granular casts** are also called muddy casts and they are present in ATN and represent progressive disease
- **Hyaline casts** are present in Chronic renal failure
- **RBC casts** are dysmorphic RBCs on urine microscopy and presence of more than 25% RBC casts is a specific test for the diagnosis of glomerulonephritis.
- **WBC casts** are present in pyelonephritis and acute interstitial nephritis.

45. A 52 year old diabetic patient is admitted with history of bilateral flank pain associated with hematuria and vomiting for 5 days. Labs were done which showed creatinine 5.2 and urinalysis showing blood ++++ and protein trace. Ultrasound KUB showed bilateral mild to moderate hydronephrosis with no stone. IVP was done which showed multiple non enhancing filling defects in pelvi calyceal systems. What is the most probable cause of acute kidney injury?

    A. Diabetic nephropathy

    B. Acute interstitial nephritis

    C. Acute tubular necrosis

    D. Acute papillary necrosis ✓

    E. Bilateral ureteric stones

ATIN

IVV

DM/
CMP

Ans: Acute papillary necrosis

Explanation: Acute kidney injury in diabetic patients with flank pain and hematuria with no proteinuria, always rule out papillary necrosis. It occurs due to ischemic necrosis of the renal papillae. Necrosis also occurs in the medullary pyramids. Patients can present with both acute episodes and chronic renal papillary necrosis. Calyceal or ureteral obstruction by sloughed papillae manifests with flank pain, hematuria and varying degrees of renal impairment. Anuria or oliguria may be present in the fulminant stage if renal failure develops. Urinary stasis leads to pyelonephritis with fever, chills or rigors. Renal papillary necrosis is visible when excreted contrast material, e.g. at IVP, fills a necrotic cavity located centrally or peripherally in the papillae. Contrast-enhanced CT during the excretory phase can depict necrosis as clearly as does IV urography and thus allow accurate diagnosis of the condition. IV urography is the investigation of choice. Typical findings of IV urography are;

- **Hooks and spurs** which occur due to shrinkage and irregularities of papillae which leads to widening of calyceal fornices
- **Ring shadows**
- **A calyx without papillae**
- **Sequestered papilla**

46. Which of the following is the most common cause of renal papillary necrosis?
    A. Analgesic nephropathy
    B. Diabetes mellitus ✓ A
    C. Sickle cell trait
    D. Tuberculosis
    E. Hypertension

NSAIDs

Ans: Diabetes mellitus A/N

Explanation: Renal papillary necrosis occurs due to ischemic necrosis of the papilla due to its poor blood supply. The most common cause in adults is diabetes mellitus and the most common cause in children is sickle cell trait. Other causes include analgesic nephropathy, TB, shock, dehydration, coagulopathy, renal vein thrombosis and hemophilia.

47. Which one of the following patient related factor supports the use of peritoneal dialysis over hemodialysis?
    A. Age 72 years
    B. Cirrhosis with ascites
    C. LVF with EF 25%
    D. Early Alzheimer's disease
    E. Bleeding disorder

Ans: LVF with EF 25%

Explanation: Around a third of patients reaching end-stage renal failure have heart failure at start of dialysis, with the highest incidence and prevalence in the elderly, this diagnosis being the most frequent cause of hospital admission and readmission. In heart failure, hemodialysis removes fluid more rapidly and in large quantity which can leads to hypotension and electrolytes imbalance can occurs which leads to arrhythmias. Peritoneal dialysis achieves ultrafiltration more slowly and cheaply and is largely performed at home. Cognitive deficits, ascites and bleeding disorders are relative contraindication for peritoneal dialysis.

48. A 45 year old male presented with severe right flank pain for 3 hours. Patient has history of lumbar back pain which was treated with piroxicam for 2 years. Labs were done which showed high urea and creatinine with blood on urinalysis. Plain X ray abdomen is normal. IV urogram showed clubbed calyces and ring signs. What is the diagnosis?

    A. Acute interstitial nephritis
    B. Renal calculi
    C. Pyelonephritis
    D. Papillary necrosis
    E. Acute tubular necrosis

A

NSAIDS

Ans: Papillary necrosis

Explanation: Kidney injury with long term NSAIDs intake occurs due to either chronic interstitial nephritis or papillary necrosis. In this patient, who presented with flank pain with typical diagnosis of papillary necrosis on IV urogram, suggest papillary necrosis due to analgesic use as the most probable cause.

49. A patient with stage 4 kidney disease has follow up labs done which showed Hb 9.8, MCV 83, MCH 30, with creatinine 4.1. Patient is taking oral iron. Iron studies showed ferritin 340 and transferrin saturation of 22%. What should be the next best step in treatment? 100?

    A. Continue oral iron
    B. Stop oral iron
    C. Start IV iron
    D. IV iron + epoetin
    E. PRBC transfusion

10-12.

[illegible]

Ans: IV iron + Epoetin

Explanation: This patient was on oral iron therapy with normal iron studies results, but still hemoglobin is on lower side which should be 11-12 in CKD patients. Best next step would be to add Epoetin which is erythropoietin analog along with IV iron to keep the iron stores repleted because iron deficiency is the most common cause of EPO resistance.

50. A 25 year old male is diagnosed case of Wilson disease is started on penicillamine therapy 6 months back. Patient presented with pedal edema and periorbital swelling. 24 hour urinary protein is 6.5g. What is the most probable cause of nephrotic syndrome in this patient?
    - A. Minimal change disease
    - B. Membranous nephropathy ✓
    - C. Membranoprolifrative GN
    - D. Focal segmental glomerulosclerosis
    - E. Amyloidosis

Ans: Membranous nephropathy

Explanation: Penicillamine is a sulfur containing amino acid that chelates copper and promotes its urinary excretion. Among its adverse effects are proteinuria and nephrotic syndrome. The most common histological type causing nephrotic syndrome is membranous nephropathy. Some cases are also associated with ANCA associated rapidly progressive GN. In case of renal involvement cessation of penicillamine therapy and substitution by trientine is strongly recommended.

51. A young boy presented with frank hematuria after an upper respiratory tract infection. Examination showed a well looking young boy wearing bilateral hearing aids. Urinalysis showed blood ++++ and protein ++. He also has history of some kind of eye surgery 1 year back. What is the most likely diagnosis?
    - A. Diffuse proliferative GN
    - B. IgA nephropathy ✓
    - C. Alport syndrome
    - D. Polycystic kidney disease
    - E. Minimal change disease

Ans: Alport syndrome

Explanation: Combination of nephritis causing hematuria, deafness and eye problems which include corneal ulcers and lenticonus are typical of Alport syndrome, which is an X linked dominant disease. It occurs due to a defect in the gene which codes for type IV collagen resulting in an abnormal glomerular basement membrane. Light microscopy is normal and electron microscopy shows splitting of lamina densa.

52. A patient of CKD came for review. Labs showed high phosphate and normal calcium with high PTH level. What should you recommend?
    - A. Calcium carbonate
    - B. Calcium acetate ✓ X-ll
    - C. Sevelamer
    - D. Calcitriol
    - E. Cinacalcet

[illegible]

Ans: Sevelamer

Explanation: First step in treating this patient should be to control hyperphosphatemia with phosphate binders. The next step in deciding either calcium containing or non calcium containing phosphate binders should be used, check calcium level. If low, start either calcium acetate or calcium carbonate. If calcium is normal or high, then Sevelamer or lanthanum carbonate is used. Calcitriol is started when phosphate levels are normal because calcitriol will increase the level of phosphate. Cinacalcet is used when PTH is consistently high despite using initial management.

53. Which of the following primary disease has the highest rate of recurrence in renal transplant patients?
    - A. IgA nephropathy
    - B. Focal segmental glomerulosclerosis
    - C. Membranoprolifrative GN ✓ M
    - D. Membranous nephropathy
    - E. Chronic interstitial nephritis

Ans: Membranoprolifrative GN

Explanation: MPGN => **80-100% reoccurrence**

IgA => **60%**

FSGS => **50%**

Membranous => 20%

Alport syndrome and polycystic kidney disease and interstitial nephritis do not reoccur in transplant kidney.

54. A 39 year old male presented with lower back pain 5 days back for which you have prescribed celecoxib 200mg. Today patient presented with passing excess urine associated with nausea and maculopapular rash. Labs were done which showed urea 96 mg, creatinine 3.7 and urinalysis showed blood +++, protein ++ and WBC +++ with eosinophils. What is the most likely diagnosis?
    - A. Minimal change disease
    - B. Acute interstitial nephritis ✓
    - C. Acute tubular necrosis
    - D. Drug induced lupus
    - E. Papillary necrosis

Ans: Acute interstitial nephritis

Explanation: Acute non oliguric kidney injury with eosinophilia on urinalysis after NSAIDs intake is typical of acute interstitial nephritis. The presence of eosinophils in urinalysis has a sensitivity of 67% and specificity of 83% for the diagnosis of AIN.

55. A patient with nephrotic syndrome has renal biopsy which showed normal glomeruli and lipid droplets in tubules on light microscopy and immunofluorescence does not show any glomerular deposit. What is the most likely diagnosis?
    - A. Amyloidosis
    - B. Membranous nephropathy
    - C. Minimal change disease
    - D. Membranoprolifrative GN
    - E. Focal segmental glomerulosclerosis

Ans: Minimal change disease

Explanation: Nephrotic syndrome with normal glomeruli on light microscopy with no immunoglobulin or complement deposit on immunofluorescence is diagnostic of minimal change disease. The most common light microscopy finding is lipid droplets in renal tubules. Electron microscopy shows fusion of podocytes.

In minimal change disease, biopsy is rarely indicated because ***the most important diagnostic point is steroid response.***

56. A patient with known active hepatitis B on treatment presented with pedal edema. Labs were done which showed albumin 1.7. Urinalysis showed protein ++++ and blood +. 24 hour urinary protein result is 8.3g. What is the cause of nephrotic syndrome in this patient?
    - A. Minimal change disease
    - B. Membranous nephropathy
    - C. Focal segmental glomerulosclerosis
    - D. Membranoprolifrative GN
    - E. Amyloidosis

Ans: Membranous nephropathy

Explanation: The most common histological type of nephrotic syndrome in chronic hepatitis B infection is membranous nephropathy followed by membranoprolifrative GN.

57. A 12 year old male child presented with recurrent episodes of urinary tract infections. USG abdomen was done which showed bilateral mild hydronephrosis. You suspect vesicoureteral reflux. How will you confirm this?
    - A. IV pyelography
    - B. Post void urine volume
    - C. Micturition cystourethrogram
    - D. DMSA scan
    - E. Retrograde pyelography

Ans: Micturition cystourethrogram

Explanation: Micturating cystourethrography is a fluoroscopic study of the lower urinary tract in which contrast is introduced into the bladder via a catheter. The purpose of the examination is to assess the bladder, urethra, postoperative anatomy and micturition in order to determine the presence or absence of bladder and urethral abnormalities, including vesicoureteral reflux. **This is the gold standard test for the diagnosis of reflux nephropathy.** DMSA scan is the gold standard test for acute pyelonephritis.

58. A 45 year old male is started on first line anti tuberculous therapy for pulmonary TB 1 week back. Patient presented with complaints of lower limb swelling. Labs showed high urea and creatinine levels. What is the most probable cause of kidney injury in this patient?

    A. Drug induced lupus
    B. Uric acid nephropathy
    C. Acute interstitial nephritis
    D. Urinary tract TB
    E. Acute glomerulonephritis

R Cth ca

Isoniazid P

AIN

Ans: Acute interstitial nephritis

Explanation: Acute kidney injury after starting ATT => ***acute interstitial nephritis due to rifampicin***. It has temporal relation with initial therapy and occurs with continuous therapy of rifampin.

Kidney injury during therapy with interrupted regimen occurs due to rifampicin induced tubular necrosis due to antibodies directed against tubular cells. Drug induced lupus does not affect kidneys.

59. A diagnosed case of SLE patient has urinalysis result which showed protein 3+ with blood ++. Creatinine is 1.1. What should be the next best management step?

    A. Methylprednisolone
    B. Cyclophosphamide
    C. Hydoxychloroquine
    D. Renal biopsy
    E. Repeat urinalysis after 3 months

HCQ

Steroids

Ans: Renal biopsy

Explanation: This patient has lupus nephritis which is defined as persistent proteinuria > 0.5 g per day or greater than or equal to 3+ by dipstick and/ or presence of red cell casts or cellular casts. Guidelines recommend that all patients with clinical evidence of lupus nephritis undergo renal biopsy so that glomerular disease can be classified. *All types of lupus nephritis do not need treatment so first step should be to check the type of lupus nephritis*. HCQ can be used but best step here should be biopsy.

60. Which of the following is the most common lesion in lupus nephritis?

    A. Minimal mesangial
    B. Mesangial proliferative

C. Focal proliferative

D. Diffuse proliferative

E. Membranous

Ans: Diffuse proliferative is the most common type of lupus nephritis

61. Which of the following class/ classes of lupus nephritis should be treated with immunosuppression?

A. Class I + II

B. Class II + III

C. Class III + IV

D. Class VI

E. All types should be treated

Members

M, F, D, M.

Ans: Class III and IV

Explanation: All types of Class III and class IV lupus nephritis should be treated with mycophenolate or cyclophosphamide plus glucocorticoids. Pure class V lupus nephritis with nephrotic range proteinuria is also treated with mycophenolate plus methylprednisolone. For Class I treatment is symptoms based. Class II is also treated symptoms based but if there is persistent proteinuria for more than 3 months, low dose prednisone can be used. Class VI is treated symptoms based.

62. Which of the following laboratory tests will be normal in active lupus nephritis?

A. ESR

B. CRP ✓

C. Anti dsDNA

D. C3 and C4

E. Anti C1q antibody

Ans: CRP

Explanation: CRP is typically remains normal in active lupus nephritis until there is active infections or synovitis present. Anti dsDNA levels are high, C3 and C4 levels are reduced, ESR is raised and anti C1q antibodies is positive in active lupus and these tests are commonly used for monitoring disease activity of lupus nephritis.

63. A 30 year old female with nephrotic syndrome due to unknown etiology has a renal biopsy which showed presence of mesangial and capillary immune deposits. There is hyaline thrombi and homogeneous and rigid thickening of peripheral capillary loops. Immunofluorescence showed staining for IgG, IgM and IgA with C3 and C1q in both mesangium and subendothelial deposits. What is the diagnosis?

A. Membranous nephropathy
B. Membranoprolifrative GN
C. Lupus nephritis ✓ C3
D. Focal segmental glomerulosclerosis
E. Amyloidosis

Ans: Lupus nephritis

Explanation: The typical histology of mesangial and subendothelial deposits with hyaline thrombi and wire loop appearance (homogeneous and rigid thickening of peripheral capillary loops) with presence of the three classes of immunoglobulins with C3 and C1q is a well known **full house pattern** of lupus nephritis and it is not present in other diseases.

- **Class I and II:** mesangial deposits of immunoglobulins and complement
- **Class III:** mesangial and capillary wall deposits in a segmental distribution
- **Class IV:** Intense, global and diffuse subendothelial deposits with mesangial deposits
- **Class V:** Diffuse subepithelial granular deposits of IgG and V3 with C1q. IgA usually absent. *The presence of C1q in membranous nephropathy should suspect SLE as the cause.*

64. A 22 year old female has history of watery diarrhea 1 day ago for which her GP given her metronidazole and ciprofloxacin. Today patient presented with nausea and decrease urine output. Labs showed high urea and creatinine. CBC showed Hb 9.8 and platelets 140,000. What is the most probable diagnosis?

A. Pre renal AKI
B. Acute tubular necrosis
C. Acute interstitial nephritis
D. Hemolytic uremic syndrome
E. IgA nephropathy

Cho
Dow Cipro

Ans: Hemolytic uremic syndrome

HUS

Explanation: All of the above causes can be possible in this patient but history of antibiotics use and low hemoglobin and low platelets in this patient suggest hemolytic uremic syndrome as the most probable cause. The most common pathogen leading to the development of HUS is shiga toxin producing E.coli O157:H7. HUS caused by STEC and pneumococcus is called typical HUS. Causes of secondary or atypical HUS include: SLE, APLS, malignancy, stem cell and organ transplant, malignant hypertension, postpartum and drugs. For typical HUS, the treatment is supportive only and plasma exchange is used for neurological or cardiac involvement. For atypical HUS, the standard of care is eculizumab, which is a humanized anti-C5 antibody. If eculizumab is not available, daily plasma exchange should be used for 4-6 weeks.

TTP

65. A patient with history of AKI due to contrast induced nephropathy has first session of hemodialysis presented with generalized tonic clonic seizure and confusion after the session of dialysis today. What is the cause of seizures in this patient?

Retic

T.

   A. Hypercalcemia
   B. Hyperphosphatemia
   C. Dialysis disequilibrium ✓
   D. Hypokalemia
   E. Uremic encephalopathy

HUS.

AN.

Ans: Dialysis disequilibrium

Explanation: Hypercalcemia, hypokalemia and hyperphosphatemia do not cause seizures and uremic encephalopathy after hemodialysis session is less likely to be the cause in this patient. The most probable diagnosis here is dialysis disequilibrium syndrome which usually occurs during the first few sessions of dialysis when the urea is more rapidly cleared from the plasma than from the brain. After dialysis, water enters the brain following an osmotic gradient. This results in an increase in brain extracellular water and brain edema. Decrease in intracellular pH and generation of osmolar molecules may also contribute to cerebral edema.

66. A known patient of long standing rheumatoid arthritis on methotrexate and monthly Infliximab therapy presented with pedal edema which is getting progressively increased. Labs were done which showed 4+ proteinuria with no hematuria. What is the most probable cause of this new presentation?

   A. Methotrexate toxicity
   B. Infliximab toxicity

AdLM

Scanned with CamScanner

C. NSAIDs induced

D. Secondary amyloidosis

E. Membranous nephropathy

Ans: Secondary amyloidosis

Explanation: Secondary amyloidosis is a rare complication of long standing rheumatoid arthritis. The precursor molecule RA associated amyloidosis is amyloid A. *Kidney is the most common organ affected by amyloidosis and it causes nephrotic range proteinuria*. It is confirmed by renal biopsy. If kidney biopsy is contraindicated, then rectal biopsy is more useful than biopsy of abdominal fat pad. Biopsy is typically positive for Congo red staining and green birefringence on examination with polarized light is characteristics. Colchicine, cyclophosphamide and tocilizumab are used in treatment.

Note: **Biopsy of the affected organ by amyloidosis is the best investigation to confirm amyloidosis, if less invasive approach is considered then rectal biopsy is better than fat pad biopsy.**

67. Which of the following is the most common histological lesion in patients with HIV induced nephropathy?

A. Focal segmental glomerulosclerosis

B. Tubulointerstitial nephritis

C. Thrombotic microangiopathy

D. Membranous nephropathy

E. Membranoprolifrative GN

Ans: Focal segmental glomerulosclerosis

Explanation: The collapsing type of focal segmental glomerulosclerosis is the most common histological type of HIV induced nephropathy. It accounts for almost 99% of cases. Other glomerular lesions include IgA nephropathy, cryglobulinemia, tubulointerstitial nephritis and thrombotic microangiopathy. Kidney biopsy is required to confirm the diagnosis.

68. Which of the following is a cause of chronic kidney disease with shrunken kidneys?

A. Amyloidosis

B. HIV nephropathy

C. Polycystic kidney disease

D. Chronic interstitial nephritis

E. Myeloma kidneys

Ans: Chronic interstitial nephritis

Explanation: All of the above are causes of CKD with normal or enlarged kidneys except chronic interstitial nephritis in which kidneys are small in size.

69. A 60 year old male with ESRD on hemodialysis came for his dialysis session today. Blood pressure was 160/100 at the start of the dialysis. During dialysis, patient complains of sweating and weakness. BP checked is 90/60. What should be the next initial treatment?

   A. 200ml saline bolus

   B. 50 ml salt poor albumin

   C. Discontinue ultrafiltration ✓

   D. Do ECG

   E. Start dopamine infusion

10-14

Ans: Discontinue ultrafiltration

Explanation: Hypotension is the most common acute complication of hemodialysis. Excessive ultrafiltration is the most common cause of hypotension with inadequate compensatory vascular filling. The first step should be to stop ultrafiltration. If hypotension still persists, then give 100-250 ml of saline or 10 ml of 23% saturated hypertonic solution or salt poor albumin. Cardiac ischemia should be ruled out in persistent low blood pressure if clinical indications are present.

70. A 57 year old male has ESRD due to chronic glomerulonephritis. What is the best treatment for him?

   A. Hemodialysis

   B. Continuous ambulatory peritoneal dialysis

   C. Continuous cyclic peritoneal dialysis

   D. Renal transplant

   E. Best supportive care

Ans: Renal transplant

Explanation: Transplantation of human kidney is the treatment of choice for end stage renal disease. Every patient of ESRD is a potential candidate for renal transplant until some contraindication exists.

71. A patient with history of renal transplant 3 months back on cyclosporine and azathioprine came with history of decrease urine output for 3 days. Patient has taken clarithromycin 5 days back for an upper respiratory tract infection. Labs showed high creatinine and high potassium levels. What is the most probable diagnosis?

   A. Acute transplant rejection
   B. CMV infection
   C. Chronic graft rejection
   D. Cyclosporine toxicity
   E. Azathioprine toxicity

Ans: Cyclosporine toxicity

Explanation: Clarithromycin and other macrolide compete with calcineurin inhibitors for P450 catabolism and cause elevated levels of cyclosporine. Cyclosporine have an afferent arteriolar constrictor effect on the kidney and cause kidney injury with high creatinine and hyperkalemia.

72. A 45 year old male presented with hematuria and flank pain for 2 weeks. Patient is anxious as his father and paternal uncle died of kidney failure. Examination showed a mass palpable in both iliac fossae. What is the probable cause?

   A. Medullary cystic kidneys
   B. Retroperitoneal fibrosis
   C. Polycystic kidney disease
   D. Nephronopthisis
   E. Alport syndrome

Ans: Polycystic kidney disease

Explanation: Autosomal dominant polycystic kidney disease is characterized by progressive formation of epithelial lined cysts in the kidneys. The enormous growth of these cysts leads to the loss of normal surrounding tissues and loss of renal function. Hundreds and thousands of cysts are present in the kidneys of most patients in the 5th decade and kidney can reach a fourfold increase in length and weigh up to 20 times the normal weight. The most common presentation is abdominal mass, flank pain, hypertension and hematuria. Hematuria results from cyst rupture.

Medullary cystic kidneys have *CKD with small fibrotic kidneys*. Nephronopthisis also causes *small fibrotic kidneys*. Alport syndrome does not cause enlarged kidneys.

73. Which of the following is the most common cause of mortality in patients with autosomal dominant polycystic kidney disease?

A. Pyelonephritis

B. Bleeding

C. Ischemic heart disease

D. Intracranial bleeding

E. Renal cell carcinoma

Ans: Ischemic heart disease

Explanation: Cardiovascular complications of ADPKD are the major cause of mortality followed by infections. The most common risk factor for cardiac disease is hypertension. Renal cell carcinoma is a rare complication.

74. What type of renal stones are common in polycystic kidney disease?

A. Uric acid

B. Calcium oxalate

C. Calcium phosphate

D. Cystine

E. Struvite

Ans: Uric acid

Explanation: Kidney stones are present in 20% of patients with PKD and more than half of the kidney stones in these patients are uric acid stones. The remainder are calcium oxalate and calcium phosphate. An abnormal transport of ammonium, low urine pH, and hypocitruria are the most common abnormalities leading to formation of stones.

75. Which of the following is the most common valvular pathology in patients with polycystic kidney disease?

A. Mitral stenosis

B. Mitral valve prolapse

C. Tricuspid stenosis

D. Tricuspid valve prolapse

E. Aortic regurgitation

Ans: Mitral valve prolapse

Explanation: Mitral valve prolapse occurs in 30% of patients with PKD and is the most common valvular pathology. Tricuspid valve prolapse is less common.

76. Which of the following imaging modality is used for the screening of the family members of a patient of autosomal dominant polycystic kidney disease?
    - A. Plain X-ray KUB
    - B. Ultrasound abdomen
    - C. CT scan
    - D. MRI
    - E. Genetic testing

Ans: Ultrasound abdomen

Explanation: Ultrasonography is the procedure of choice in the workup of patients with autosomal dominant polycystic kidney disease (ADPKD). It is also ideal for screening patients' family members. Ultrasonographic diagnostic criteria for ADPKD1 is:

- At least 2 cysts in 1 kidney or 1 cyst in each kidney in an at-risk patient younger than 30 years
- At least 2 cysts in each kidney in an at-risk patient aged 30-59 years
- At least 4 cysts in each kidney for an at-risk patient aged 60 years or older

CT and MRI have high sensitivity but not used for screening. CT may be useful in doubtful cases in children or in complicated cases (e.g., kidney stone, suspected tumor).

77. A known case of CKD 3b presented with lower GI bleeding for 5 days. Colonoscopy was planned to confirm the cause. Patient was prepared with Kleen enema containing sodium phosphate and sodium pico sulphate and polyethylene glycol. Patient developed anuria with high urea and creatinine. What is the probable cause?
    - A. Pre renal AKI
    - B. Acute interstitial nephritis
    - C. Acute tubular necrosis
    - D. Acute phosphate nephropathy
    - E. Acute urate nephropathy

Ans: Acute phosphate nephropathy

Explanation: Acute phosphate nephropathy is a serious complication of phosphate containing enema and laxatives for bowel preparation before colonoscopy. It results from calcium phosphate crystal deposition in the tubules and interstitium and causes AKI. *This is the reason phosphate containing drugs should be avoided in CKD.*

78. Which of the following is a risk factor for the formation of staghorn calculus of kidney?

    A. Diary products consumption
    B. E. coli infection
    C. Urine pH 8.2
    D. Hypocalcemia
    E. Male sex

MgAP

↑pH Alkaline

Ans: Urine pH 8.2

Explanation: Staghorn calculus are also called Struvite stones or triple magnesium ammonium phosphate. They are formed in the presence of increased urinary ammonia and when pH is more than 7.2. Increased urinary ammonia is produced when urease containing bacteria like proteus, Klebsiella and mycoplasma are present. E.coli is urease negative. Hypercalcemia also increased the risk. Females are more likely to have staghorn calculus than men. Struvite stones grow quickly and fill the renal pelvis which is called staghorn calculus.

79. A known case of Crohn disease patient presented with left flank pain associated with hematuria. X-ray KUB showed a stone in the left renal pelvis. What is most likely type of renal stone in this patient?

    A. Uric acid
    B. Triple phosphate
    C. Xanthine
    D. Calcium oxalate
    E. Cystine

Ans: Calcium oxalate

Explanation: Risk factors for calcium oxalate stones include higher urine calcium, higher urine oxalate and lower urine citrate. This stone type is insensitive to pH in the physiological range. In Crohn disease, fatty acids are not absorbed which bind to dietary calcium leading to higher oxalate absorption and higher level of urinary hyperoxaluria. It leads to formation of calcium oxalate stones.

80. A 35 year old male has history of recurrent urinary stones for which lithotripsy was needed. Stone composition analysis showed calcium oxalate stones. What treatment should be given to prevent the stone formation?

A. Vitamin C supplements

B. [✓ Hydrochlorothiazide] Hypercalciuria

C. Bisphosphonate

D. Urinary alkalinization

E. Low Calcium diet

Ans: Hydrochlorothiazide

5.5

Explanation: A thiazide diuretic in doses higher than those used to treat hypertension can lower urine calcium excretion and reduce the risk of calcium oxalate stone formation by 50%. Dietary calcium restriction is not beneficial and infact is likely to be harmful. Bisphosphonate may reduces urine calcium excretion but they are not recommended for stone prevention. Vitamin C supplements increases the risk of calcium oxalate stone formation. Calcium oxalate stones are insensitive to pH changes so urinary alkalization has no benefit.

81. A 25 year old male presented with right flank pain associated with hematuria and nausea for 2 hours. X-ray KUB was done which is normal. Helical CT was done which showed a 12mm stone in renal pelvis. What can be the most probable type of stone in this patient?

A. Uric acid stone ✓

B. Calcium oxalate

C. Calcium phosphate

D. Cystine

E. Triple phosphate

Ans: Uric acid stone

Explanation: Stones seen on x-ray KUB are called radiopaque or radiodense and those not seen are called radiolucent. Calcium phosphate stones are most dense followed by Calcium oxalate and triple stones. Cystine stones are mildly radiopaque where as uric acid stones are typically radiolucent.

The two main risk factors for uric acid stones are low urine pH and high uric acid excretion. The mainstay of prevention of uric acid stone formation includes increasing urine pH by alkalinization of the urine and by reducing uric acid generation by giving allopurinol.

82. Which of the following is not a prevention method to reduce the formation of cystine stones?

    A. Tiopronin therapy

    B. Penicillamine therapy

    C. Potassium citrate

    D. High fluid intake

    E. High dose Pyridoxine ✓

Ans: High dose pyridoxine

Explanation: High dose pyridoxine is used in the prevention of calcium oxalate stones in patients with type 1 primary hyperoxaluria. The focus of prevention of cystine stones is to increase cystine solubility in the urine. This is achieved by treatment with medication that binds to cystine and that raises the urine pH. Tiopronin and penicillamine binds urinary cystine and increases its solubility whereas potassium citrate increased the urinary pH. Maintaining a high urine volume is an essential component of prevention of all kinds of stones.

83. What type of kidney stones are formed in patients with distal renal tubular acidosis?

    A. Calcium oxalate

    B. Calcium phosphate ✓

    C. Uric acid

    D. Cystine

    E. Struvite ✓

Ans: Calcium phosphate

Explanation: Higher urine pH, lower urinary citrate and higher urine phosphate levels are risk factors for the formation of calcium phosphate stones and these features are present in type 1 or distal RTA. pH > 6.5 is typically associated with higher risk of calcium phosphate stones formation. RTA and hyperparathyroidism is the common risk factor for calcium phosphate stones formation.

84. A 42 year old male with history of membranous nephropathy on steroids presented with sudden onset of left flank pain and hematuria. Examination showed left flank tenderness with enlarged left testis. Labs showed creatinine 7.8 which was 2.1 one week back. What is the most probable diagnosis?

    A. Renal cell carcinoma

    B. Ureteric stone

C. Acute pyelonephritis

D. Acute papillary necrosis

E. Renal vein thrombosis

Ans: Renal vein thrombosis

Explanation: Sudden onset of flank pain with hematuria and testicular swelling associated with rapid decline in kidney function in a patient with membranous nephropathy should raise a suspicion of renal vein thrombosis. Membranous nephropathy increase the risk of renal vein thrombosis due to loss of antithrombin III in urine and over production of procoagulant factors by liver. Diagnostic screening should be done by Doppler ultrasound. Treatment is anticoagulation.

85. A 62 year old male, a known case of DM, hypertension and hyperlipidemia with triple vessel coronary artery disease, has angiography for NSTEMI. After 2 days, patient has developed rash on lower limbs with bluish discoloration of right toe. What next test should be done in this patient?

A. CBC

B. ESR

C. Urinalysis

D. Urea and creatinine

E. CPK

Ans: Urea and creatinine

Explanation: Skin rash and blue toe syndrome after angiography in a patient who is arteriopath should raise a suspicion of cholesterol embolism syndrome. Urea and creatinine should be checked in all patients because CES effects kidneys in all cases. Although all of the other tests should also be done but RFTs are must. CBC will show eosinophilia in 80% of patients. Urinary eosinophilia is also present. CPK level is also increased in some cases. ESR and CRP are also raised. The gold standard test is skin biopsy which will show cholesterol crystals in arterioles.

86. Urinalysis result of a patient with kidney stones showed hexagonal colorless crystals. These crystals are associated with?

A. Uric acid stone

B. Cystine stones

C. Calcium phosphate stones

D. Calcium oxalate stones

E. Triple phosphate stones

Ans: Cystine stones

Explanation: Hexagonal colorless crystals are typical of cystine stones. Calcium phosphate crystals are colorless and needle or star like. Struvite crystals are rectangle prisms shaped. Calcium oxalate crystal are dumbbell or envelope shaped. Uric acid crystals are yellow or orange brown in color and barrel or plate like.

87. Which of the following is not a characteristic feature of chronic tubulointerstitial nephritis?
    - A. Nephrogenic diabetes insipidus
    - B. Fanconi syndrome features
    - C. Anion gap metabolic acidosis
    - D. Hyperkalemia
    - E. Small echogenic kidneys

TIN

AIN

Ans: Anion gap metabolic acidosis

Explanation: Tubular disorders occur in patients with chronic tubulointerstitial nephritis. Non anion gap metabolic acidosis with hyperkalemia occurs due to type IV RTA in patients with CTIN. It occurs due to impaired ammoniagenesis and acquired resistance to aldosterone. Other tubular defects include nephrogenic diabetes insipidus leading to polyuria due to salt losing enteropathy, defective proximal tubular reabsorption leading to features of Fanconi syndrome (glycosuria, phosphturia, aminoaciduria, hypokalemia) and type II RTA due to bicarbonaturia. Chronic tubulointerstitial nephritis leads to small echogenic kidneys on ultrasound.

88. A 68 year old male presented with recurrent episodes of hematuria, right flank pain and weight loss for 3 months. Examination showed BP 160/100, a palpable mass in right lumber region and patient looks plethoric. Hemoglobin is 19.4. What is the next best step in management?
    - A. Ultrasound kidneys
    - B. Doppler of kidneys
    - C. CT abdomen, pelvis and chest
    - D. PET scan
    - E. Cystoscopy

Hyper Hepatic

Ans: Ct abdomen, pelvis and chest

Explanation: The typical triad of pain, hematuria and mass in lumber region suggest renal cell carcinoma as the cause. It is also associated with hypertension and secondary polycythemia. The initial evaluation in this patient should include CT with contrast of the chest, abdomen and pelvis for diagnosis and staging of renal cell carcinoma.

89. A 53 year old male admitted with fever and lower abdominal pain and a CT of the abdomen and pelvis was done to rule out diverticulitis. The CT also showed an incidentally found 5.2 cm right renal mass suspected to be renal cell carcinoma without regional lymph nodes involvement. CT chest is normal. What should be the next best step in management?

    A. Bone scan
    B. MRI brain
    C. Partial or radical nephrectomy
    D. Start on sunitinib
    E. Active surveillance

2cm

Ans: Radical or partial nephrectomy

Explanation: The mass is greater than 4 cm and less than 7 cm with no lymph nodes involvement, so the best management for this patient should be a referral to urologist for consideration of partial or radical nephrectomy. Active surveillance is an option for tumors < 4cm in greatest dimensions. Bone scan and MRI brain are not used for the initial investigation for metastasis in RCC.

90. A 25 year old female presented with history of recurrent episodes of dysuria and fever for 1 year. She has been treated for UTI 5 times in the last year. What should be the most appropriate next step?

    A. Urine C/S
    B. USG abdomen
    C. CT abdomen and pelvis
    D. Genital examination
    E. Retrograde pyelography

Ans: Urine culture and sensitivity

Explanation: Urine culture and sensitivity is the standard test which should be done in all patients with recurrent UTI.

- An uncomplicated UTI is one that occurs in a healthy host in the absence of structural or functional abnormalities of the urinary tract. Recurrent uncomplicated UTI may be defined as 3 or more uncomplicated UTIs in 12 months.
- Recurrent UTIs occur due to bacterial reinfection or bacterial persistence. Persistence involves the same bacteria not being eradicated in the urine 2 weeks after sensitivity-adjusted treatment. A reinfection is a recurrence with a different organism, the same organism in more than 2 weeks, or a sterile intervening.
- Culture and sensitivity analysis should be performed when symptomatic and in 2 weeks from sensitivity-adjusted treatment to confirm UTI, guide further treatment and exclude persistence.
- Cystoscopy and imaging are not routinely necessary in all women with recurrent UTI.
- Women with risk factors for a complicated cause for recurrent urinary tract infection should be evaluated by cystoscopy and imaging. Women suspected of having a complicated UTI without knowledge of a specific abnormalities should receive a CT urogram or abdominopelvic ultrasound +/– abdominal x-ray.

When working up recurrent uncomplicated UTI, culture and sensitivity analysis should be performed at least once while the patient is symptomatic. This workup confirms a UTI as the cause for the patient's recurrent lower urinary tract symptoms. Additionally, adjustment of empirical therapy based on sensitivity may eradicate resistant bacteria as a cause for bacterial persistence and recurrent UTI.

91. A 35 year old male presented with history of weight loss, low grade fever and dysuria for 6 months. Urinalysis showed pus cells 25-30 with culture came to be negative three times. USG showed mild bilateral hydronephrosis. MTB culture grows mycobacterium tuberculosis. What should be the treatment for this patient?

    A. ATT for 6 months
    B. ATT for 12 months
    C. [✓ ATT for 12 months + ureteric reconstruction]
    D. ATT+ nepheroureterectomy
    E. Nepheroureterectomy alone

CNS.
Adm. 4-12
Dem 6-12 HB

Ans: ATT for 12 months + ureteric reconstruction

Explanation: Urogenital tuberculosis (UGTB) is the second most common form of extrapulmonary TB in countries with severe epidemic situations. Kidney is most commonly affected followed by epididymis and prostate. Urogenital TB is classified as follow:

Kidney TB (KTB):

- Level 1, non destructive form; TB of parenchyma => **treatment ATT only**
- Level 2, TB papillitis, small destructive form => **treatment ATT only**
- Level 3, cavernous TB kidney, destructive form with one or two caverns => **ATT + partial nephrectomy**
- Level 4, polycavernous kidney TB, widespread destruction with more than 2 caverns => **nephrectomy + ATT**

Complications of kidney TB: 2 7

Ureteric TB: stricture formation with hydronephrosis=> treatment is ATT + reconstruction surgery if KTB level 1-3, nepheroureterectomy if KTB level 4.

1RER 1RJ
1RE 2 7
Renal 9 RPG 10 1RJ

Bladder TB: For grade 1 and 2=> ATT

Grade 3=> ATT + trospium chloride

Grade 4 => ATT + cystectomy

ATT should be given for 8-12 months for uncomplicated cases and 12-14 months for complicated patients. The treatment is 2 months of isoniazid 10mg /kg + rifampicin 10 mg/kg, + PZA 20mg/kg + ofloxacin 800 mg followed by 10 months of isoniazid and rifampicin.

92. A 35 year old female presented with dysuria and frequency of urination for 3 days. Urinalysis was done which showed Leucocyte esterase positive and nitrite positive with 50-60 pus cells. She was started on ciprofloxacin 500 mg twice daily empirically. After 1 week, patient still complains of same symptoms with no improvement. Culture was done which showed E. coli with extended spectrum beta lactamase. What is the best next treatment for this patient?
    A. Shift to levofloxacin
    B. Cefixime oral
    C. Linezolid oral
    D. Ertapenem IV

E. Aztreonam IV

Ans: Ertapenem IV

Explanation: Extended spectrum beta lactamase (ESBL) gram negative bacilli are resistant to beta lactam antibiotics including penicillin, cephalosporins and aztreonam. The drug of choice for the treatment of ESBL E coli is carbapenems which includes Meropenem, imipenem and ertapenem. Ertapenem has an advantage of once daily dosing as compared to Meropenem and Imipenem, so it's preferred in ambulatory patients who can have this drug at home. Most of the strains of ESBL are also resistant to quinolones, so quinolones are not used for the treatment of ESBL. Linezolid is a treatment for MRSA and VRE.

93. A 36 year old female is diagnosed as having hypertension on routine examination. Blood pressure was 165/105. All the blood tests were normal. You have started her on lisinopril 5 mg once daily. After 1 week, patient came back with complaining of feeling weakness with muscles pains. You have ordered the blood tests which showed urea 126, creatinine 3.5, K 5.9, HCO3 16 with a blood pressure of 160/100. What is the most probable diagnosis?

B - [illegible]

A. Acute tubular necrosis

B. Papillary necrosis

C. Renal artery stenosis

D. Acute interstitial nephritis

E. Hypertensive nephropathy

Ans: Renal artery stenosis

Explanation: The sequence of events in this patient who is a newly diagnosed case of hypertension with all the blood tests normal at presentation, has developed acute kidney injury after starting lisinopril points towards the possible diagnosis of renal artery stenosis. Kidney functions and potassium should be measured after 1 week of ACE inhibitors therapy. A 25% decrease in GFR and increase in potassium is normal after starting ACE inhibitors. If more than this, stop ACE inhibitors and rule out renal artery stenosis with screening by Doppler ultrasound. *MR Angiography is gold standard*. ACE inhibitors cause dilation of both afferent and efferent arteriole but predominantly cause efferent arteriolar dilation. In renal artery stenosis, maintenance of adequate intraglomerular pressure for filtration depends greatly on efferent arteriolar vasoconstriction. ACE inhibitors decrease this intraglomerular pressure and this reduce the filtration and can cause acute kidney injury. They are contraindicated in bilateral renal artery stenosis.

94. A diagnosed case of multiple myeloma, was on treatment, presented with pedal edema and periorbital swelling. Labs showed albumin 2.1, creatinine 1.3 and 24 hour urinary protein is 5.7g. Renal biopsy showed focal segmental glomerulosclerosis. What can be the cause in this patient?
    - A. Celecoxib
    - B. Pamidronate ✓
    - C. Melphalan
    - D. Vincristine
    - E. Thalidomide

Pam ⇒ M

NSAID

Ans: Pamidronate

Explanation: Pamidronate is commonly used in the treatment of multiple myeloma to reduce the bone pains. Pamidronate causes direct podocytes injury with disruption of cytoskeleton with focal segmental glomerulosclerosis. NSAIDs are associated with minimal change disease.

95. A 65 year old male with previous radiation therapy for colorectal carcinoma presents with weight loss, malaise, nausea and dull abdominal and back pain. He has also noticed increased frequency and hesitancy of urination. Bloods reveal a normochromic anaemia, increased ESR and renal failure. His renal failure does not improve with fluids and an ultrasound is organised. This reveals a retroperitoneal mass. What is the most likely diagnosis?
    - A. Aortic aneurysm
    - B. Amyloidosis
    - C. Retroperitoneal fibrosis ✓
    - D. Metastasis
    - E. Renal cell carcinoma

Ans: Retroperitoneal fibrosis

Explanation: Retroperitoneal fibrosis is characterized by fibro inflammatory tissue around the aorta and iliac arteries, into the retroperitoneum and surrounding other structures such as the ureters. It is thought to be an autoimmune process to insoluble lipid leaking from atherosclerotic plaques. This can lead to an obstructive uropathy. In the majority, there is no clear underlying cause found, however it has been associated with aortic aneurysm, renal tract trauma, infection, retroperitoneal malignancy, post irradiation and chemotherapy and with certain drugs such as methysergide, beta blockers, methyldopa and amphetamines. It has also been associated with certain autoimmune disease and vasculitis such as

PBC, Rheumatoid arthritis, SLE and polyarteritis nodosa. Lymphomas, sarcoma, pancreatic carcinomas and other malignancies can also lead to similar appearances to it on ultrasound and these are therefore differentials. However in this case the previous radiation therapy is a clue and MRI can be utilized to assess further the degree of fibrosis. A biopsy may be required if the other differentials cannot be excluded. Intravenous urography is useful in assessing the degree of ureteric obstruction. Removal of the offending agent, steroids, immunosuppressant and ureterolysis and ureteric stent placement for obstruction have all been utilized in the management.

RN

Poisoning

1. A 27 year male presented in emergency with altered sensorium after taking an unknown substance. ABGs were done which showed pH 7.29 with low bicarbonate and low PaCO2. His lactate level is high. Blood pressure is normal. Which of the followings can be the cause of poisoning in this patient?

   A. Salicylate poisoning
   B. Methanol poisoning ✓
   C. Ferrous sulphate poisoning
   D. Ethylene glycol poisoning
   E. Paraldehyde poisoning

Ans: Ferrous sulphate poisoning

Explanation: All of the above are the causes of acidosis with normal lactate level (except in circulatory shock, which is less likely with normal blood pressure) except ferrous sulphate poisoning which causes acidosis with high lactate level. Other causes of poisoning with high lactate level are Metformin, cyanide, sodium valproate and CO poisoning.

2. A 35 year old male was brought in emergency by 1122 who was found in a street in altered sensorium. ABGs of the patient is sent which showed high anion gap metabolic acidosis with high osmolal gap. Which of the followings is the most probable cause of poisoning in this patient?

   A. Salicylate poisoning
   B. Paracetamol poisoning
   C. [✓ Methanol poisoning]
   D. Ferrous sulfate poisoning
   E. Carbon monoxide poisoning

Ans: Methanol poisoning

Explanation: All of the above are the causes of high anion gap metabolic acidosis. To narrow down the differentials, osmolal gap is calculated next. Causes of high anion gap metabolic acidosis with high osmolal gap are ethanol, methanol and ethylene glycol poisoning. All other are causes of normal osmolal gap.

(For the detailed discussion regarding anion gap, osmolal and delta gap, refer to acid base and electrolyte imbalance topic)

3. Which of the following is an indication of multiple-dose activated charcoal therapy in a patient with poisoning?
   - A. Ethanol poisoning
   - B. Ferrous sulfate poisoning
   - C. Carbamazepine poisoning
   - D. Lithium poisoning
   - E. Paracetamol poisoning

Ans: Carbamazepine poisoning

Explanation: Multiple-dose activated charcoal refers to the administration of two or more sequential doses of activated charcoal (50 g q 4hrly) for enhanced elimination of the ingested toxin. MDAC appears to prevent ongoing absorption of drug remaining within the GI tract and enhance elimination via enterohepatic or entero-enteric recirculation. It is also called GI dialysis. It is beneficial for "potentially life-threatening" ingestions of carbamazepine, dapsone, phenobarbital, quinine, and theophylline.

It is important to note that activated charcoal does not effectively adsorb alcohols, metals such as iron and lithium, electrolytes such as magnesium, potassium, or sodium, and acids or alkalis due to the polarity of these substances. So activated charcoal is not used in these poisoning. Gastric lavage is used in these poisoning except in alkali and acids intake where gastric lavage is contraindicated.

In all other cases of poisoning, single dose activated charcoal is used.

4. Which of the following drug poisoning is an indication for whole bowel irrigation?
   - A. Paracetamol poisoning
   - B. Theophylline poisoning
   - C. Digoxin poisoning
   - D. Ferrous sulphate poisoning
   - E. Ethanol poisoning

Ans: Ferrous sulphate poisoning

Explanation: Whole bowel irrigation is suitable for conscious patients who have ingested tablets that don't bind well to charcoal and can be identified on a plan radiograph. It should be considered in the management of patients who have ingested substantial amount of ferrous sulphate as morbidity is high and other options are limited. Other Indications for whole bowel irrigation are lithium toxicity, poisoning with enteric coated drugs and removal of ingested packets of illicit drugs.

5. A patient is presented in emergency after taking an unknown substance for suicide. It is decided to increase the urinary pH by giving sodium bicarbonate to enhance the elimination. This treatment method will be effective in the management of which poisoning?

   A. Paracetamol poisoning
   B. Theophylline poisoning
   C. Lithium poisoning
   D. Ferrous sulphate poisoning
   E. Salicylate poisoning

Ans: Salicylate poisoning

Explanation: If the urine is alkalinised with pH > 7.5 by the administration of sodium bicarbonate weak acids like Salicylate and methotrexate become highly ionized resulting in enhanced Urinary excretion. Urinary alkalinization is currently recommended in the management of clinically significant salicylate poisoning when the criteria for hemodialysis is not met. It is also used in the management of methotrexate poisoning sometimes.

6. A 26 year old female is brought in emergency after taking some unknown amount of unknown drugs. Patient is in deep coma. A decision is taken to do emergency hemodialysis to eliminate the drugs from body. Which of the following drug cannot be eliminated from the body with hemodialysis?

   A. Lithium
   B. Salicylate
   C. Valproic acid
   D. Amitriptyline
   E. Ethylene glycol

Ans: Amitriptyline

Explanation: Tricyclic antidepressants have large volume of distribution so they cannot be eliminated from the body with Hemodialysis and hemodialysis is not indicated in the management of TCA poisoning. All the other options are eliminated by dialysis effectively.

7. A 29 year old female presented in emergency with history of taking more than 100 tablets of paracetamol at once 1 hour back. You have given her the activated charcoal. What should be your next best management step?

   A. Start acetylcysteine

   B. Start methionine

   C. [✓ Check paracetamol level at 4 hours]

   D. Refer for liver transplant

   E. Whole bowel irrigation

20

20 tab
12 gms.

Ans: Check paracetamol level at 4 hours

① ②

Explanation: After ABC, give activated charcoal if patient presents within 1 hour of ingestion of paracetamol. If significant paracetamol dose (> 75mg/kg of body weight) is suspected, the next best step is to measure paracetamol concentration after at least 4 hours have elapsed and plot this level on nomogram. If level are above the line, treatment with NAC is indicated. NAC without measuring paracetamol level is also indicated in staggered over dose where multiple ingestion of PCM have taken place over several hours or days.

8. A 24 year old female presented with paracetamol poisoning. Her ALT is 4210 and AST 3500. Which of the following parameters of this patient is an indication of liver transplant?

   A. ALT which is increasing

   B. AST which is increasing

   C. [✓ pH of 7.21 after fluid resuscitation]

   D. Bilirubin of 5.8

   E. Grade II encephalopathy

④

⑮

Ans: pH 7.21 after fluid resuscitation

Explanation: King's college criteria for referring the patient for liver transplant in paracetamol poisoning include:

- pH < 7.3 after fluid resuscitation or

In a 24 hours period, all 3 of the following:

- INR > 6 or PT > 100 seconds uncorrected
- Creatinine > 3.39 mg/dl

- Grade III or IV encephalopathy

Modified KCC also added lactate > 3.0mmol/l after fluid resuscitation.

9. Which of the following is not a feature of salicylate poisoning?
   A. Hyperglycemia
   B. Metabolic acidosis
   C. Hyperkalemia ✓
   D. Respiratory alkalosis
   E. Pulmonary edema

K+ leaves body c̄ salicylates

Ans: Hyperkalemia

Explanation: Hypokalemia rather than hyperkalemia is a feature of salicylate poisoning. It should be corrected before giving sodium bicarbonate for urinary alkalinization. All the other are features of salicylate poisoning.

10. Which of the following is not an indication for hemodialysis in a patient presented with aspirin poisoning?

salicylate

   A. Aspirin level of 150mg/dl at admission
   B. pH 7.24 after resuscitation
   C. Aspirin level of 50mg/dl after 6 hours of ingestion
   D. Non cardiogenic pulmonary edema
   E. Renal failure

Ans: Aspirin level of 50mg/dl after 6 hours of ingestion

Explanation: Indications of hemodialysis in aspirin poisoning include:

- Aspirin level > 120 mg/dl acutely or > 100 mg/ dl 6 hours post ingestion or 700 mg/l of aspirin concentration.
- Refractory acidosis
- Non cardiogenic pulmonary edema
- Severe toxicity with CND depression, ARDS, AKI, or coagulopathy

11. A 27 year old female presented in emergency after taking multiple medications of his father which he was using for some neuropathic pains. Patient is unconscious with a GCS of 12/15 and pupils are dilated. ECG was done which showed broad QRS complex. Patient has history of one episode of generalized tonic clonic fits. What is the most likely diagnosis?

    A. Duloxetine poisoning

    B. Tramadol poisoning

    C. Paroxetine poisoning

    D. Amitriptyline poisoning ✓

    E. Gabapentin poisoning

phenytoin

Ans: Amitriptyline poisoning

Explanation: Unconsciousness, seizures with broad QRS complex on ECG is more suggestive of amitriptyline (TCA) poisoning. The peripheral autonomic nervous system, central nervous system and the heart are the main systems that are affected following overdose. Initial or mild symptoms typically develop within 2 hours and include tachycardia, drowsiness, a dry mouth, nausea and vomiting, urinary retention, confusion, agitation, and headache. More severe complications include hypotension, cardiac rhythm disturbances, hallucinations, and seizures. Electrocardiogram (ECG) abnormalities are frequent and a wide variety of cardiac dysrhythmias can occur, the most common being sinus tachycardia and intraventricular conduction delay resulting in prolongation of the QRS complex and the PR/QT intervals. Seizures, cardiac dysrhythmias, and apnea are the most important life-threatening complications.

Management of TCA poisoning include:

- Intubation if GCS<= 8 ✓ IV
- Benzodiazepine for agitation
- Consider gastric lavage only if within one hour of a potentially fatal overdose.
- Activated charcoal if presented within 1st hour with secure airway
- ECG should be done at presentation and use for risk stratification
- ABGs should also be done at presentation and then for monitoring. It is also used for risk stratification.
- IV fluid initially for hypotension, sodium bicarbonate if not corrected with IV fluids.
- If QRS> 0.16 seconds, sodium bicarbonate to keep pH between 7.45-7.55.

- Give sodium bicarbonate (50 ml of 8.4%) if pH <7.1, RS >0.16 seconds, Arrhythmias and hypotension.
- 10mg glucagon or magnesium sulfate for refractory arrhythmia. Phenytoin should be avoided, no role of dialysis.
- Benzodiazepine for seizures. Phenytoin should be avoided ?? TCA poisoning
- Discharge asymptomatic patients with normal ECG after 6 hours.

Q [illegible] Q

12. A 21 year old medical student presented in emergency with history of taking unknown quantities of propranolol after a failure in examination. Patient has a heart rate of 35 and blood pressure of 90/60 with cold extremities. Initial resuscitation with atropine, isoprenaline and IV fluid is unsuccessful. What treatment should be given next?

    A. Intubation and ventilation
    B. Norepinephrine infusion
    C. Epinephrine infusion
    D. Glucagon Infusion
    E. Lipid emulsion therapy

120 - 100 · 7

SGLT2

NO

Ans: Glucagon infusion

Explanation: Glucagon infusion should be considered in the treatment of beta blockers toxicity not responding to initial resuscitation. Another option is high dose insulin infusion with dextrose therapy called hyperinsulinaemia euglycemic therapy. Lipid emulsion therapy has a role in severe poisoning not responding to any other agents.

DPP4

13. A 21 year old female presented in emergency complaining of nausea, vomiting, excessive sweating, ringing in the ears and blurred vision after taking some medications. RBS at presentation is 50 mg/dl associated with low blood pressure. Which of the following is the most likely cause of poisoning in this patient?

    A. Paracetamol poisoning
    B. Lithium toxicity
    C. Quinine poisoning
    D. [✓ Propranolol poisoning]
    E. Amitriptyline poisoning

6.0 - 7.0
7.8 - 11.

Ans: Quinine poisoning

Explanation: Patient has typical triad of cinchonism: sweating, tinnitus and vomiting and nausea with blurred vision associated with hypoglycemia and Hypotension. Triad of cinchonism, hypoglycemia and hypotension in a patient with poisoning occurs in quinine toxicity most probably. Treatment is supportive.

14. A 26 year old male is brought in emergency by 1122 who has taken more than 10 tablets of lorazepam. Examination showed GCS of 12/15 with normal vitals and a respiratory rate of 14/min with normal oxygen saturation. Pupils are mildly constricted with normal response to light. ECG is also normal. Patient has history of epilepsy controlled with valproic acid. What should be the next best management step in this patient?

    A. [✓ Supportive care only]
    B. Flumazenil therapy
    C. Naloxone IV
    D. Intubation and ventilation
    E. Discharge with follow up after 1 week

Ans: Supportive care only

Explanation: This patient with history of intentional intake of benzodiazepine with no other abnormality except sedation. There is no indication of flumazenil therapy and is relatively contraindicated in a patient with history of epilepsy as it lowers the seizures threshold. Naloxone is used in opioid poisoning and intubation is indicated when GCS is less than 8. Discharge is not recommended in a sedated patient, so the best management at this stage is supportive care only with monitoring.

15. You received a call from Operation Theater for a 32 year old female who has developed high grade fever, tachycardia with sudden elevation of blood pressure after patient was given general anesthesia. Examination showed temp 39.8, pulse 135 and a blood pressure of 175/119. There is generalized muscle hyper tonicity with spasm of facial muscles. What is the next best immediate management step after ABC?

    A. IV labetalol infusion
    B. Broad spectrum antibiotics
    C. Hydrocortisone 250 mg IV
    D. [✓ IV dantrolene]
    E. Therapeutic hypothermia

Ans: IV dantrolene

Explanation: This patient has developed malignant hyperthermia as a complication of general anesthesia. The best immediate management should be ABC and then commencing IV dantrolene as early commencement is associated with reduced mortality. P

16. You have received 10 patients from a marriage ceremony who are confused and aggressive with slurring of speech. When you examined the patients, they fail to meet your gaze when you are taking history from them. Face is flushed and there is smell of alcohol. ABGs were done which showed high anion gap metabolic acidosis with increased osmolal gap. What is the most appropriate initial step in management?

    A. High dose folic acid

    B. IV fluid + vitamin B12

    C. Oral 40% ethanol

    D. IV fomepizole

    E. Urgent hemodialysis

NOA NOA

Ans: IV fomepizole

Explanation: Features are suggestive of acute alcohol intoxication with confusion, slurring of speech and alcohol smell. The history of Inability to follow the gaze is suspicious that patients may have blurring of vision or blindness which is a feature of methanol poisoning. This is a common scenario in emergency when patients presented with methanol poisoning. If there is suspicion of methanol, IV fomepizole should be started as soon as possible after taking blood sample for methanol levels. If fomepizole is not available, ethanol oral can be used for treatment. IV folinic acid is used along with ethanol and fomepizole. Hemodialysis is also indicated in severe toxicity not responding to initial treatment.

17. Which of the following is not a feature of theophylline toxicity?

    A. Hypokalemia

    B. Hypoglycemia

    C. Hyperglycemia

    D. Tachycardia

    E. Increased myocardial contractility

Ans: Hypoglycemia

Explanation: Hyperglycemia rather than hypoglycemia is a feature of theophylline toxicity.

18. A 25 year old female presented in emergency after taking more than 50 tablets of aspirin. She is otherwise asymptomatic except mild epigastric discomfort and tachypnea. Labs were done which showed pH 7.38, lactate 1mmol/l and a Salicylate level of 670mg/L at 6 hours post ingestion. What treatment should be given to her?
    - A. IV saline 0.9%
    - B. Acetylcysteine
    - C. IV NaHCO3 ✓
    - D. Urgent dialysis
    - E. Reassure and discharge

120 / 120

100 / 100.

Ans: IV NaHCO3

Explanation: Salicylate level of more than 450 and less than 700 6 hours after ingestion is an indication for urinary alkalinization with IV NaHCO3 to keep the urine pH 8.0-8.5 ideally.

19. You have received a 21 year old male in emergency who is confused. When you start talking to him he tells you that he is feeling on top of the world and is an alien. He also told you that he can see the music as color coming from cell phone but denies any hallucinations. Examination showed high blood pressure. He is also taking water continuously. What is the most likely diagnosis?
    - A. Opioid poisoning
    - B. Alcohol poisoning
    - C. Amphetamine poisoning
    - D. LSD poisoning ✓
    - E. Cocaine poisoning

Ans: LSD poisoning

Explanation: This patient has typical features of LSD intoxication which are synesthesia, in which sensations are perceived in a different modality like seeing music. It can also causes grandiosity and expansive mood. Hypertension is a common feature of LSD poisoning and patient also takes water excessively due to increased thirst and leads to dilutional hyponatremia. Diazepam is the drug of choice for agitation.

20. A known case of celiac disease patient with dermatitis herpetiformis on treatment presented in emergency with shortness of breath, headache and progressive altered sensorium. Examination showed peripheral cyanosis with oxygen saturation of 85% despite high flow oxygen. ABGs showed normal PaO2 with metabolic acidosis. What is the most likely diagnosis?

    A. Carbon monoxide poisoning
    B. Lactic acidosis
    C. Methaemoglobinaemia
    D. Cyanide poisoning
    E. Salicylate poisoning

Ans: Methaemoglobinaemia

Explanation: Patient has history of celiac disease and dermatitis herpetiformis for which dapsone is used for treatment. Methaemoglobinaemia is a recognized complication of dapsone. Methemoglobin results from the presence of iron in the ferric form instead of the usual ferrous form. This results in a decreased availability of oxygen to the tissues. Symptoms are proportional to the methemoglobin level and include skin color changes and blood color changes at levels up to 15%. As levels rise above 15%, neurologic and cardiac symptoms arise as a consequence of hypoxia. Levels higher than 70% are usually fatal. Methemoglobin causes a leftward shift of the oxygen-hemoglobin dissociation curve, resulting in decreased release of oxygen to the tissues. Cyanosis with low oxygen saturation and normal PaO2 which fails to respond to 100% oxygen is very suggestive of methaemoglobinaemia. Treatment is IV methylene blue.

21. A 23 year old female presented in emergency with massive hematemesis associated with severe abdominal pain after ingested some unknown medicines. Labs were done which showed glucose 255, high urea, creatinine, ALT of 3400 and AST of 2500 with metabolic acidosis on ABGs. PT and APTT are also raised. X-ray abdomen showed multiple dense looking masses in Intestine. What is the most likely diagnosis?

    A. Salicylate poisoning
    B. Diclofenac poisoning
    C. Ferrous sulfate poisoning
    D. Paracetamol poisoning
    E. Warfarin poisoning

Ans: Ferrous sulphate poisoning

Explanation: Multiorgan failure, GI hemorrhage, hyperglycemia and coagulopathy, metabolic acidosis and hemolysis with dense masses on x-ray in a patient with poisoning suggest the diagnosis of ferrous sulphate poisoning.

Iron is a toxic drug in high doses. 20mg/kg is the fatal dose. Features of iron overdose are:

- Direct corrosion: Abdominal pain, vomiting and GI bleeding with hyperglycemia due to decrease release of insulin from pancreas
- Hemolysis of blood sample due to iron overload
- High anion gap metabolic acidosis with slightly raised lactate
- Coagulopathy with APTT deranged more than PT
- Acute liver failure, encephalopathy, myocarditis and renal failure

Liver.

DCM. [illegible]

Treatment is whole bowel irrigation and chelation therapy with desferrioxamine.

22. A 25 year old patient is brought in emergency by 1122 who was found unconscious at a bus stop. Examination showed pinpoint pupils with a respiratory rate of 10/min. What initial treatment should be considered in this patient?
    - A. IV flumazenil
    - B. IV atropine
    - C. IV naloxone
    - D. IV glucagon
    - E. IV NaHCO3

Ans: IV naloxone

Explanation: Triad of loss of consciousness+ pinpoint pupils and respiratory depression in a young patient is more suggestive of opioid intoxication and initial treatment with IV naloxone should be considered which will have a dramatic response.

23. A 45 year old on multiple medications for different problems presented in emergency with nausea and vomiting associated with drowsiness and blurring of vision. Examination showed ataxia and coarse tremors of outstretched hands. Patient is vitally stable except a blood pressure of 155/95. What is the most likely cause of her presentation?
    - A. Alcohol intoxication

B. Serotonin syndrome

C. Lithium toxicity

D. TCA poisoning

E. Neuroleptic malignant syndrome

Ans: Lithium toxicity

Explanation: These are the early feature of lithium toxicity. Remember that in exams if patient presents with coarse tremors, it shows lithium or cyclosporine toxicity. A fine tremor in both cyclosporine and lithium is seen in therapeutic levels.

Mild to moderate toxicity=> treat with normal saline

Severe toxicity=> Hemodialysis

24. A 20 year old university student is brought in emergency in winter season who is confused. She had multiple episodes of vomiting. Examination showed erythematous mucosa. You suspect carbon monoxide poisoning. What is the most appropriate initial management for her?

    A. High flow oxygen

    B. Hyperbaric oxygen

    C. BIPAP therapy

    D. Reassurance

    E. Normal saline

Ans: High flow oxygen

Explanation: The best initial treatment for carbon monoxide poisoning is 100% oxygen. Hyperbaric oxygen therapy is used if there is neurological signs or myocardial ischemia despite treatment with 100% oxygen.

25. A 26 year old male from a village of Punjab admitted in emergency in a state of circulatory collapse after taking something. ECG showed multiple ectopics. There is garlic smell from the patient. Blood pressure is not getting better despite adequate resuscitation with IV fluids and triple ionotropic support. Which poisoning should be suspected in this patient?

    A. TCA poisoning

    B. Aspirin poisoning

    C. Aluminium phosphide poisoning

    D. Ferrous sulfate poisoning

E. Calcium channel blockers poisoning

MgSO4 Hydrocortisone Ca gluconate

Ans: Aluminum phosphide poisoning

Explanation: Refractory circulatory shock with a garlic smell and ECG changes after ingestion of unknown substance is more suggestive of aluminum phosphide or wheat pill poisoning.

26. A 22 year old female presented in emergency with history of taking unknown quantity of rat pills. She is otherwise asymptomatic. Which single blood test you will order initially and for monitoring?
    A. CBC
    B. ABGs
    C. PT
    D. Troponin
    E. LFTs

Heparin aPTT

Warfarin PT

5-8

Ans: PT

Explanation: Rat pills are mostly warfarin and superwarfarin like agents and cause coagulopathy. PT should be checked at presentation and for monitoring.

27. A 26 year old female from the village background is referred to emergency in respiratory distress after taking some unknown poison. Patient has Cervicofacial edema with dysphonia and dysphagia and have stridor. Urgent tracheostomy was done. Labs showed high CPK level with chocolate color urine. What is the most probable diagnosis?
    A. Organophosphate poisoning
    B. Rat pills poisoning
    C. Paraphenylenediamine poisoning
    D. Aluminium phosphide poisoning
    E. Cyanide poisoning

↓ Angioedema

Ans: Paraphenylenediamine poisoning

Explanation: Cervicofacial edema with stridor and rhabdomyolysis and chocolate color urine is suggestive of Paraphenylenediamine or kala pathar or hair dye poisoning. Hair-dye poisoning is emerging as a common method of suicide, especially in the low socioeconomic populations. Oral ingestion of kala pathar can lead to the development of angioneurotic edema, or cardiotoxicity leading to fatal arrhythmias and death within the first six to 24 hours. The typical clinical features of poisoning include cervicofacial edema

(87.5%), dysphagia (87.5%), chocolate-brown-colored urine (87.5%), pain and/or rigidity of limbs (75%), decreased urine output (37.5%), and convulsions (25%). Respiratory failure is the most common cause of death and emergency tracheostomy should be done in almost all patients. Other treatment is supportive.

28. A 40 years old farmer presented in emergency with shortness of breath, vomiting and sweating. Examination showed mouth ulceration, bilateral crackles in chest and tremors. Labs showed very high ALT and AST with derainged kidney function. What can be the possible cause in this patient?
    A. Organophosphate poisoning
    B. Wheat pill poisoning
    C. Paraquat poisoning
    D. Strychnine poisoning
    E. Salicylate poisoning

Ans: Paraquat poisoning

Explanation: History of village background, farmer, dyspnea with crackles, mouth ulceration and multiorgan failure suggests the diagnosis of paraquat poisoning. Presence of mouth ulceration and multiorgan failure on presentation rules out OP poisoning and wheat pill poisoning. Paraquat is a highly toxic herbicide and is a common agent in suicide in 3rd world, especially Asia (lethal in small amounts, cheap, available). It is the leading single agent causing death from pesticide poisoning in many countries. Typical clinical features are:

- Ulceration of the mucous membranes (paraquat tongue), esophageal perforation
- Nausea
- Sweating
- Vomiting
- Tremors
- Convulsions
- Pulmonary edema
- Cardiovascular collapse
- Renal failure (early)
- Liver dysfunction with abnormal LFTs
- Acute alveolitis over 1–3 days followed by a secondary fibrosis (3-7 days) with death at up to 5 weeks.

Steps in the management of paraquat poisoning are:

- **Fullers earth (non-plastic clay): 30%, 250mL Q 4 hourly -> until comes out in stools**
- **OR**
- **Activated Charcoal**
- **Early NGT recommended (due to mucosal injury)**
- **Avoid gastric lavage (caustic injury, and unlikely to provide any benefit)**
- **Titrate O2 (can worsening pulmonary fibrosis, mild hypoxia is acceptable e.g. SpO2 >88%)**
- **Immediate plasma exchange or haemofiltration (not likely to change outcome – distribution to the lungs occurs <2h)**
- **Immune suppression with cyclophosphamide, MESNA, methylprednisolone and dexamethasone to dampen inflammatory reaction.**
- **Antioxidants such as acetylcysteine and salicylate might be beneficial through free radical scavenging, anti-inflammatory and NF-κB inhibitory actions.**
- **Patients in extremis should be palliated.**

29. A 37 year old truck driver is admitted in emergency with left sided chest pain and restlessness. Examination showed high blood pressure, tachycardia, tremors, and dilated pupils. Patient has attended some night party with friends. ECG showed ST segment depression. What diagnosis should be considered in this patient?

A. Cannabis intoxication
B. Opioid intoxication
C. Alcohol intoxication
[✓ D. Cocaine intoxication]
E. LSD intoxication

Ans: Cocaine intoxication

Explanation: Chest pain with hypertension and mydriasis in a young patient with ECG changes should raise suspicion of cocaine intoxication. Cocaine causes coronary artery vasospasm. Treatment is benzodiazepine and IV nitrates for chest pain and hypertension with no ECG changes and PCI for chest pain and ischemic changes on ECG. Beta blockers should be avoided.

30. A 22 year old medical student presented in emergency with restlessness, insomnia, feeling of impending doom, jaw clenching and tremors. He is using some medications to stay awake for studies. Examination showed tachycardia, dilated pupils and tremors. What diagnosis should be considered in this patient?

A. Cannabis intoxication
B. Amphetamine intoxication
C. LSD intoxication
D. Alcohol intoxication
E. Opioid intoxication

Ans: Amphetamine intoxication

Explanation: History of use of medications to stay alert with signs and symptoms of CNS stimulation and bruxism raise suspicion of amphetamine intoxication. Treatment is supportive.

31. A 24 year old female from a village background presented in emergency with shortness of breath and excessive sweating. Examination showed excessive secretion in mouth, excess sweating and pinpoint pupils. ECG showed sinus bradycardia. After initial resuscitation, what specific treatment should be started immediately in this patient?

A. IV naloxone
B. IV atropine
C. [✓ IV pralidoxime]
D. IV diazepam
E. IV isoprenaline

Ans: IV atropine

Explanation: The signs and symptoms in this patient are typical of organophosphate poisoning. The most important and specific treatment for OP poisoning is IV atropine. Early and sufficient doses of atropine is potentially lifesaving in patients with severe toxicity. Atropine reverses the life-threatening symptoms of OP like bronchospasm, bronchorrhea, hypotension and bradycardia. Pralidoxime is administered along with atropine and it does not reverse the life-threatening symptoms and prevents further muscles weakness or CNS effects. So, if a question asks you about the specific and most important treatment in OP poisoning, it is atropine.

32. Which of the following is not a feature of the intermediate syndrome in organophosphate poisoning?

    A. Rapidly progressive muscle weakness
    B. Involved muscles of respiration
    C. Usually occurs after 2-3 weeks of exposure
    D. No specific treatment
    E. Mostly occurs after resolution of acute cholinergic symptoms

1-4

Ans: Usually occurs after 2-3 weeks of exposure

GBS

Explanation: Upto 20% of patients with OP poisoning develops weakness that spreads rapidly from the ocular muscles to those of the head and neck, proximal limbs and the muscles of respiration resulting in ventilatory failure. This is called intermediate syndrome which generally develops quite rapidly between 1 and 4 days after exposure, often after resolution of the acute cholinergic syndrome, and May last two to three weeks. There is no specific treatment but supportive care including maintenance of airway and ventilation should be provided to the patient. OP induced delayed polyneuropathy usually occurs after 2-3 weeks of acute exposure.

-4

33. A patient presented in emergency after a snake bite 4 hours back. There is marked local swelling at the site of bite. There is also bleeding from the gums and clotting time is markedly raised. Which snake is responsible for this?

    A. Elapid
    B. Viper
    C. King cobra
    D. Krait
    E. Sea snake

Ans: Viper

Explanation: There are five typical syndromes of snake bite:

Syndrome 1: Local envenoming (swelling) with bleeding/ clotting disturbances => all species of Viperidae

Syndrome 2: Local swelling+ bleeding/ clotting disturbance+ shock or AKI=> Russell's viper

Syndrome 3: Local swelling + paralysis => cobra or king cobra

Syndrome 4: **Paralysis with minimal or no swelling with or without abdominal pain => krait**

Bitten in sea and freshwater lakes=> sea snake

Syndrome 5: **Bitten on land, paralysis and bilateral ptosis with dark brown color urine and AKI with bleeding/ clotting disturbance=> Russell's viper.**

34. Which of the following is the best and rapid test used for the diagnosis of coagulopathy in snake bite?

A. [✓ **Clotting time**]

B. **Bleeding time**

C. **Prothrombin time**

D. **Partial prothrombin time**

E. **Thrombin time**

Ans: Clotting time

Explanation: **20 minutes whole blood clotting test is a simple, bedside test which only requires a new, clean and dry glass tube. Positive result of non-clotting indicates severe consumption coagulopathy and immediate antivenom treatment. All the other tests are more sensitive laboratory tests which should also be measured.**

35. Which of the following is not an indication of antivenom treatment after snake bite?

A. PT 10 seconds prolonged

B. Bilateral ptosis

C. [✓ Local swelling at bite marks only]

D. Acute kidney injury

E. Enlarged tender lymph nodes draining bitten limb

Ans: Local swelling at bite marks only

Explanation: Indications of antivenom treatment in snake bite are:

- Spontaneous systemic bleeding, coagulopathy (20WB clotting time + ive, INR > 1.2, PT > 5 seconds prolonged), thrombocytopenia
- Neurotoxicity (Bilateral ptosis, external opthalmoplegia, paralysis)
- Cardiovascular abnormalities (Hypotension, shock, arrhythmia)

- Acute kidney injury, Hemoglobinuria, rhabdomyolysis
- Local swelling involving more than half bitten limb in the absence of tourniquet within 48 hours of bite
- Swelling after bites on digits
- Rapid extension of swelling beyond wrist/ankle within few hours of bite
- Enlarged tender lymph nodes draining the bitten limb

36. A 26 year old male presented in emergency after a snake bite. Patient is in respiratory distress with low oxygen saturation. There is bilateral ptosis on examination. What is the best initial management step for this patient?

    A. Antivenom treatment

    news

    B. CPAP therapy

    [✓ C. Intubation and mechanical ventilation]

    D. High flow oxygen

    E. Intramuscular neostigmine

Ans: Intubation and mechanical ventilation

Explanation: Ptosis and respiratory failure in snake bite suggests severe poisoning and the 1st step in the management of every patient in emergency is ABC. If airway is compromised or there is respiratory failure or respiratory distress, intubation with mechanical ventilation should be done before any other specific measures. Antivenom should also be given after securing airway and breathing. Antivenom treatment alone is not reliable to save the life of a patient with bulbar and respiratory paralysis.

37. A 35 year old male presented in emergency with severe pain and muscle cramps of lower limb after a bite from black widow spider. The pain is 10/10 on severity scale. Which of the following is the most effective treatment for the pain and cramps in this patient?

    A. Opioid analgesic

    B. Lorazepam

    C. Calcium gluconate

    [✓ D. Antivenom]

    E. Ketorolac

Ans: Antivenom

Explanation: Pain, muscle cramps, paraesthesia and abdominal pain are the common presentation of black widow spider bite. Antivenom is the most effective and rapid treatment option to relieve pain in these patients, but as it has a risk of Hypersensitivity reactions, initial treatment with benzodiazepine should be used. Antivenom is used in patients with pain refractory to opioid and benzodiazepine treatment. Calcium gluconate is not recommended now a days for black widow spider.

38. A 37 year old male presented in emergency with high grade fever, progressive altered sensorium and sweating for 12 hours. Patient has been started on some medications for some psychiatric issues 2 weeks back. Examination showed temp of 104 F°, tachycardia, BP 170/110, and generalized body rigidity. CT brain is normal and LP picture is also normal. What diagnosis should be considered in this patient?

A. Cerebral malaria
B. Viral encephalitis
C. Neuroleptic malignant syndrome
D. Malignant hyperthermia
E. Serotonin syndrome

Ans: Neuroleptic malignant syndrome

Explanation: Typical triad of hyperpyrexia, rigidity and unconsciousness within 2-4 weeks of starting antipsychotics is classically associated with Neuroleptic malignant syndrome. The clinical course typically begins with muscle rigidity followed by a fever within several hours of onset and mental status changes that can range from mild drowsiness, agitation, or confusion to a severe delirium or coma. Signs of autonomic nervous system instability that frequently accompany NMS include labile blood pressure, tachypnea, tachycardia, sialorrhea, diaphoresis, flushing, skin pallor, and incontinence. Once symptoms appear, progression can be rapid and can reach peak intensity in as little as 3 days. Although muscle rigidity is the most frequently described motor sign, a large number of additional extrapyramidal motor findings have been reported including tremor, chorea, akinesia, and dystonic movements including opisthotonos, trismus, blepharospasm, and oculogyric crisis. Other symptoms that have been associated with NMS include dysphagia, dyspnea, abnormal reflexes, mutism, and seizures. Characteristic laboratory findings seen in NMS include elevated creatinine phosphokinase (CPK) due to rhabdomyolysis and leukocytosis. The cerebrospinal fluid and imaging studies are usually normal, but an electroencephalogram may show nongeneralized slowing. Treatment is mostly supportive with IV hydration, cooling methods and sodium bicarbonate. Medical treatment is with Bromocriptine and dantrolene in severe cases.

39. A 43 year old heavy drinker admitted in emergency with confusion and sweating. He looks frightened and told you that he is seeing snakes everywhere. Patient also looks agitated, disoriented and there are tremors of upper and lower limbs. He has not taken alcohol for 3 days. What treatment should be given to him initially?
    - A. 40% alcohol
    - B. Disulfiram
    - C. Thiamine
    - [✓ D. Lorazepam]
    - E. Naltrexone

A

Visual

clozap

Ans: Lorazepam

Explanation: This patient has signs and symptoms of severe or major alcohol withdrawal which usually occurs 48-96 hours after the last drink and usually preceded by prolonged heavy alcohol use. Symptoms include disorientation, agitation, diaphoresis, whole body tremors, vomiting, hypertension, and hallucinations (visual>tactile>auditory). Delirium tremens is the extreme form of alcohol withdrawal. Although thiamine should be given to all alcoholic patients who presented in emergency, the most important treatment of alcohol withdrawal is benzodiazepine. For minimal, mild and moderate withdrawal either lorazepam or chlordiazepoxide can be used. For severe withdrawal and delirium tremens, IV Lorazepam is the drug of choice. Thiamine is the treatment of choice for Wernicke's encephalopathy which consists of a triad of confusion, ataxia and opthalmoplegia. Disulfiram and naltrexone are used as alcohol aversion therapy.

40. A 39 year old plumber presented with a long standing history of abdominal pain, headache, irritability and a 2 week history of wrist drop. His labs were done which showed Microcytic anemia with basophilic stippling. Lead poisoning is suspected and serum lead levels were checked which came to be 65mcg/dl. What treatment should be given to him?
    - A. Dimercaprol
    - [✓ B. EDTA]
    - C. Penicillamine

D. Unithiol

E. Desiferox

Ans: EDTA

Explanation: With lead levels between 55-69 mcg/dl, lead poisoning should be treated with edetate calcium disodium (alone. If there are convulsions or encephalopathy, add dimercaprol (BAL) with EDTA. Dimercaprol is 1st line treatment for arsenic, gold and mercury poisoning.

41. **A 55 year old patient who was admitted with hypertensive emergency was treated with nitroprusside infusion 6 hours back. Patient complains of headache, abdominal pain, and restlessness during infusion and has one episode of generalized tonic clonic fits. There is a bitter almond smell from the patient breath. ABGs showed metabolic acidosis. You have stopped the infusion. What specific treatment should be given to him?**

A. Methylene blue

B. High flow oxygen

C. Sodium nitrite+sodium thiosulfate

D. Dimercaprol

E. EDTA

Ans: Sodium nitrite+ sodium thiosulfate

Explanation: The history of nitroprusside infusion and headache, abdominal pain and seizure with typical bitter almond smell are characteristics of cyanide poisoning. There are two treatment options for Cyanide poisoning: 3% sodium nitrite 10 ml IV followed by 25% sodium thiosulfate solution 50 ml IV or Hydroxycobalamine 5g IV.

lead

EDTA